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VOLUME IX

SKIN AND VENEREAL DISEASES MISCELLANEOUS TOPICS

EDITED BY

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SKIN AND VENEREAL DISEASES

BY

WILLIAM L. BAUM, M. D.

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SKIN AND VENEREAL DISEASES.

CONSTITUTIONAL RELATIONS OF THE DERMATOSES.

Pellagra, now exploited rather sensationally by the lay and medical press, has, as must be expected under such circumstances, furnished the basis of a large number of communications during the year. Many of these are of the usual special pleading type, destitute of careful differential diagnosis. The fact that the alleged cases are most frequently described among the insane and neuropathic is not brought into control relation with the facts, pointed out nearly a decade ago in the *Practical Medicine Series,* that among these scurvy and allied autotoxic dermatosic states are peculiarly frequent, that fatal diarrheas are commonly met with among both the insane and children, and that intestinal irregularities are frequent among the neuropathic. The spoiled maize etiology is as bitterly fought out for clearly commercial reasons in certain sections as were formerly the diet questions among the insane by local meat, corn and flour merchants. The usual sensational bacteriologic discoveries have been made and disproved. The trend of evidence shows, however, that pellagra appears like other erythemata of toxic or autotoxic origin with peculiar frequency among the neuropathic.

Etiology and Symptomatology. Pellagra, according to B. R. Tucker,[1] may occur at any age from childhood to old age. In the southern States, although the negro forms the majority of the lower class, yet pellagra, is most common in the white. The disease, while affecting chiefly the lower classes, is occasionally seen among those of good hygienic and social surroundings. The

(1) N. Y. Med Jour., Feb. 4, 1911.

disease is widely spread and does not occur in local epidemics. The disease, in the cases reported, is more common in rural districts than in the cities. The majority of cases occurred in the spring and early summer. The gastro-intestinal symptoms, especially the diarrhea, are usually the first manifestations of the disease. The ingestion of maize or maize products whether spoiled or not, is not alone the cause of pellagra. Patients whose constitutions are depleted by pernicious habits or chronic diseases are not rendered thereby more susceptible to pellagra than those not so affected.

The backs of the hands are always affected in the cutaneous lesions of pellagra and the lesions are always symmetrical. Exposure to the sun cannot account for the cutaneous lesions. Stomatitis is almost a constant symptom. The nervous and mental symptoms conform to no known nervous disease or form of insanity or clinical entity. The eye symptoms are not pathognomonic. Emaciation is practically constant. The special senses are only occasionally affected. Pellagra is not *per se* a febrile disease, and when an elevation of temperature occurs it may frequently be accounted for by a complication. A moderate anemia is found in most of the cases. The heart, lungs, and genito-urinary organs do not seem to be particularly affected by pellagra. Examinations of the urine, feces, and blood show nothing pathognomonic of pellagra.

The cause of pellagra is unknown and the study of these cases throws no positive light on the etiology. Patients may have pellagra who do not eat corn products. Sunlight does not account for the condition. In these cases no parasite, toxine, bacteria, nor insect has been isolated as being the causative factor. The disease is not communicable by ordinary contact. Three great systems are affected, the digestive tract, the cutaneous surface, and the cerebrospinal and peripheral nervous systems, and their involvement seems to be in the order named. Remissions occur in over half of the cases. Death frequently occurs in the first attack. It is too early in the study of the disease in this country to estimate the mortality. Probably 50 per cent. die during

the first two years. In the cases which apparently recover it cannot be said that the patient is cured, for the apparent recovery may simply be a remission.

A Clinical Case. M. B. Hartzell[2] reports a case in a 9-year-old girl where the eruption first came on the hands, wrists and face. The nose, forehead, cheeks, backs of hands and wrists were later, when seen by Hartzell, exfoliating. The skin was violaceous, brown in color, and resembled a dermatitis due to iodin. The eruption on the hands and wrists ceased abruptly at the sleeve. The cheek, pharyngeal and lingual mucous membranes were bright red. The tongue was smooth. The patient, who had spent all her life in Pennsylvania, most of it in Philadelphia, where she was born, was much emaciated, showed marked hebetude, and had an air of extreme dejection, scarcely replying when addressed. There had been a moderate leucorrhea resistent to treatment for two months before the eruption.

In August, 1909, she began to lose flesh, became dull, depressed and listless, sat all day without moving, continually crying. Hartzell saw her for the first time April 6, 1910. After her first visit to the dispensary anorexia set in. When the vomiting ceased, an intractable diarrhea replaced it. The dermatosis first appeared in the spring, before April 10, 1910, in the form of a peculiar reddish brown dermatitis. The face and hands became "red, like sunburn." Later blebs and water blisters replaced the "sunburn." Then came the exfoliation seen by Hartzell. There was no visceral disease. The von Pirquet test gave negative results. There was marked anemia. During her first three weeks under Hartzell there was an irregular fever; the normal temperature of two days would be suddenly followed by a rise to 102° F. for a couple of days and the temperature would then return to the normal.

During her stay in the University Hospital, under regular diet, quinin, bismuth and opium, the patient began to improve. This improvement was first apparent in the hebetude. The diarrhea greatly diminished. The skin ceased desquamating, but was browner than

(2) Med. Record; July 29, 1911.

usual. After several relapses the patient passed from Hartzell's care to friends in the country where she grew irregularly worse, dying October 12, 1910. The immediate cause of her death remains unknown to Hartzell. In her case the eating of spoiled corn could be excluded with reasonable certainty.

Analysis of 3,000 Cases. S. Stern [3] has analyzed 3,000 cases reported, as against 200 cases recorded two years ago. The place of corn as an etiologic factor, and the danger that lies in last year's three billion bushel growth of maize was pointed out. The appearance of over 60 cases upon which observations had been made in Philadelphia, in and out of institutions, directed attention to the presence of the factors recognized as essential to the production of the disease, *e. g.*, poverty, poor hygienic surroundings, and corn diet.

It is a mistake, according to Stern,[4] to lay much stress upon dermatitis and pigmentation unless accompanied by other symptoms, especially by gastro-intestinal symptoms. Erythema is the first skin manifestation to make its appearance. Indeed it is doubtful it it ever be absent. The erythema is usually limited to the parts of the body exposed to the sun's rays. Its appearance upon the face in a mask-like manner was pointed out by Casal; hence the term, Casal's mask. In one case it fell as a mantle from the frontal folds of the skin of the forehead to the chin and just outside the outer canthus of the eyes and mouth, the remaining facial tissues being free and sharply defined from the pellagra eruption and in marked contrast to the affected areas. This characteristic condition is called the pellagra mask. Another condition is frequently met with, certainly suggestive, which may be independent of, or associated with, erythema:—the physiognomy with dull, apathetic, ironed-out facies, which is most distinctive in some instances. This is called by some the pellagrous mask.

The eruption may asume bizarre shapes, as the butterfly shape on the face, the bridge of the nose being the body of the butterfly, the forehead and malar processes

(3) N. Y. Med. Jour., May 27, 1911.
(4) Med. Counsel, February, 1911.

the wings. It may appear upon the back of the neck in this shape, or it may encircle the neck as a band, called Casal's collar. It appears upon the dorsum of the feet, which may be involved alone or with the legs. The dorsum of the forearms or the elbows and knees alone may be affected.

The erythema is at first followed by swelling, edema, burning or itching, and not infrequently by vesiculation, which by coalescence may form large bullæ, and present a picture not unlike erythema multiforme, a mistake in diagnosis being easily made. Later on the skin scales, and it appears as a fine, floury or branny desquamation that is most characteristic of the affection. In this state it is readily distinguished from sunburn, so commonly offered as an explanation for and diagnosis of pellagra. The desquamation of sunburn is usually in large plaques, peeling and showing destruction of the corium, the edges of the burned area everted, and showing the margin of the healthy skin; pellagra, on the contrary, is a productive instead of a desquamative state. The fine, floury or branny exfoliation appears to be superimposed upon the corium or skin itself, appearing upon the entire surface of the involved area or in small patches, and the border of the healthy skin is either indurated and above or on a level, though sharply defined, with no eversion, though slight inversion may be observed, due to atrophic changes. In the early period of pellagra the skin becomes thickened and cracked; later, with successive erythematous eruptions, atrophy occurs.

The color of the erythema may be well noted as characteristic of the disease. In many cases it appears not unlike a light iodin blush, often as an erysipelatous eruption, and sometimes as a deep purplish-red blush. Hyde pointed out that an olive green or dirty green color appears when pressure is made upon the skin. He also called attention to the skin scarring, which appears as linear scars in the long axis; and transversely, and usually parallel with the skin folds, numerous small irregularly shaped and sized scars appear upon the dorsum of the hands and forearms, and apparently

involve the more superficial layers of the skin. An eczematous appearance is not infrequently met with. It may involve the leg below the knee, (the boot type), or it may involve the anterior aspect of the leg below the knee and the dorsum of the feet. It may also involve the dorsal aspect of the forearm and hands, though it is not uncommon to meet it upon the elbows or knees, or both as an eczema or a roughening and thickening of the skin with branny scales. In one case, it made its appearance upon the back of the neck and upon the sternum, sharply outlining the latter, though extending slightly beyond the costal borders, its outline not unlike that of a sword.

Fatal Pellagra in the Insane. W. G. Spiller [5] reports cases in a 22-year-old woman and a 48-year-old man. The first showed gastric disturbance, diarrhea, salivation, discoloration of the dorsal aspect of the hands and wrists, of the back of the neck, of the nose and corners of the mouth, loss of weight, symptoms suggesting neurasthenia with mental depression, weakness in walking, tremor of the tongue, reddening of edges of the tongue, exaggeration of the patellar and Achilles tendon reflexes, ataxic movements of the lower and upper limbs, spastic ataxic gait, finally loss of gait, opisthotonos at times, and twitching movements of the whole body. The second case presented the following symptoms: Dementia at the time of admission to the hospital for the insane in 1888 at the age of forty, discoloration of the back of the hands of late development, loss of weight, diarrhea, emaciation, ataxic gait, exaggeration of the tendon reflexes, and clonic movements of the whole body.

The lesions found were intense degeneration of the nerve cells of the spinal cord and brain in the woman, and of those of the cord in the man, in whom only the cord was examined, and diffuse degeneration shown by osmic acid stain in the antero-lateral and posterior columns. There was no evidence of root degeneration. Much difference of opinion has existed as to whether pellagra is a systemic or non-systemic disease of the cord. In the two cases studied it was clearly non-sys-

(5) N. Y. Med. Jour., Apr. 1, 1911.

temic. From a study of these two cases the conclusion must be drawn that pellagra did not always produce, if indeed it ever did produce, a truly systemic disease of the nervous system; but that the degeneration was caused by some toxic or infectious substance affecting all parts of the cerebrospinal axis, producing cellular degeneration and diffuse degeneration of nerve fibers in the posterior and antero-lateral columns. It is not difficult to explain the mental symptoms when cortical degeneration is as intense as it was found to be in the brain of the woman. The insanity observed in this disease seems to be toxic in origin.

Leprosy. *Bacteriology.* According to C. W. Duval[6] in the cultivation of *Bacillus leprœ* the initial multiplication outside the body cannot be obtained unless amino acids are present in the medium. The amino acids are believed to be essential nutritives for the initial growth of the organisms. It has been demonstrated that the primary growth of the leprosy bacilli occurs only in the presence of the products of tryptic digestion. Hence, putrefactive and other bacteria which are capable of splitting nucleoproteids into their end acid products are, in consequence, of value in the isolation and cultivation of the leprosy bacilli. Amebæ are not necessary for securing the primary multiplication of the leprosy bacilli upon artificial media, and are detrimental since they feed with avidity upon the bacilli themselves.

Two methods may be employed for recovering in culture *Bacillus leprœ* from the tissues. In one (the direct), tryptophan or a mixture of albumin and trypsin are employed with a culture medium; in the other (indirect), bacterial species capable of digesting the albumin constituent of the culture medium are introduced into the medium. In both, the end result is identical, since they both provide for the presence of the amino acids in the medium, without which the primary multiplication of the leprosy bacilli cannot be secured.

B. Williams[7] has found two seemingly different microbes: a diphtheroid non-acid-fast organism, the so-

(6) Jour. Exper. Med., March, 1911.
(7) Jour. Med. Assoc., July 29, 1911.

called involution form, and an acid-fast streptothrix, similar to that of Rost and Deycke. These two types of organism seemed absolutely distinct, and at one time Williams could not transfer the non-acid-fast form into the acid-fast form at will. However, he was subsequently able to demonstrate that where a non-acid-fast diphtheroid bacillus culture is added to one of pure amebæ, at the end of about forty-eight hours the amebæ are full of bacilli which have become acid-fast. Thus it was demonstrated that the non-acid fast organism, which was descended from acid-fast lepra bacilli, could regain its acid-fastness in association with a living cell.

The association with the amebæ had a distinct influence on the bacilli not taken up by them. Many of those outside of the amebæ had become entirely acid-fast, and in others the dots in the bacilli had become acid-fast. Another factor connecting the non-acid-fast diphtheroid organism with the final acid-fast form, was provided by old cultures (two to three months old) of the non-acid-fast organism. Here the dotted bacilli tended to die out, while the involution forms, in reality only broken off streptothrix, had become more prominent and in many cases distinctly acid-fast. The acid-fast streptothrix is Gram-positive. In the diphtheroid-bacillus phase, only the involution forms are definitely Gram-positive. The dotted forms are variable.

Leprosy in Norway. According to S. R. Klein,[8] leprosy in Norway is limited to fishermen, boatmen and peasants, whose staple food consists of milk and the products of the sea. Peasants inland who suffer, have free access to fish food during its conveyance from the sea. Jennings notes that in Abyssinia there are some 8,000 lepers, who can rarely, if ever, have eaten fish, owing to the scarcity of the article in a country where, "during the greater part of the year, many of the wells do not contain water, much less fish."

In connection with the nasal infection it is noted that one of the earliest signs of nodular leprosy is a slight erythema of the skin about the root of the nose and eye-brows, sometimes extending to the malar

(8) Amer. Jour. of Derm., March, 1911.

regions, and that with these slight signs extensive ulceration of the nasal mucous membrane may be found with abundant bacilli practically in almost pure culture. Nasal obstruction is often the earliest symptom, though naturally its significance is frequently unrecognized.

S. R. Black admits that great difficulties surround the communication of the disease from individuals, and from the fact that it seems almost impossible to reproduce the disease in animals, concludes that there is some very special relation between seed and soil. He thinks that the agency of an intermediate host, be it flea, bug, or acarus, has not been proved, and mentions that if the nasal mucous membrane is the primary seat of infection, then the intermediate host theory, however enticing, must go by the board.

Black advances a theory to account for the marked clinical difference between maculo-anesthetic leprosy and nodular leprosy. He believes that nodular and mixed leprosy are simply maculo-anesthetic leprosy plus the infiltration and edema of the subcutaneous tissue in various parts of the body, caused by the active invasion of the *Bacillus leprœ*.

The tubercle bacillus does not stain well with aqueous solutions of anilin dyes; the lepra bacillus stains well, but smegma bacillus, Moeller's grass bacillus and the butter bacillus, do not really stain. The tubercle bacillus does not decolorize when treated with absolute alcohol. The lepra bacillus retains its red color, but is decolorized in a shorter time than is the tubercle bacillus. The smegma bacillus is decolorized. Moeller states that the smegma bacillus is alcohol proof.

The tubercle bacillus is found in the sputum, saliva, nasal secretions, feces, exudates, transudates, tissues, and rarely in the urine, blood and milk. The lepra bacillus is recovered from sloughing surfaces, nasal discharges, in blood recovered by incising a leprous nodule and applying firm pressure; and from the circulating blood. The smegma bacillus is recovered from the smegma of man and of the lower animals, from the skin of the groin and axilla, and from the anus and the urine. It is rarely found in exudates, tissues or the sputum. The

Moeller's grass bacillus and the butter bacillus are found about stables, upon hay, and in milk, butter, and the feces of cattle, and are always to be looked for in the urine and feces of man.

Hutchinson's theory is that the fundamental cause of true leprosy is the eating of fish in a state of commencing decomposition. The cause of the disease is, in his opinion, some ingredient or parasite generated by or introduced into fish, which has been either not cured at all or cured badly. As a result, it is maintained that the segregation of lepers will not stay the disease. So long as the food is not taken from the hands of lepers it is asserted that there is no danger from consorting with them.

Bourret examined 90 cases in French Guinea and found changes which can be considered as very characteristic. The hemoglobin value is lowered, the number of red corpuscles diminished and the erythrocytes frequently present morphologic lesions (anisocytosis, vacuoles, poikilocytosis, polychromatophilia, granular basophilia), while normoblasts also occur. The absolute number of leucocytes is generally diminished, never increased. In all the forms of the malady there frequently exists an eosinophilia, which is of great importance.

Mugliston suggests that the *Acarus scabiei* may be the carrier of the infection. He found that of 77 lepers, 44 had itch on admission, 11 of the others remembered having itch, and from the remaining 22 no history was obtainable. He thinks it possible that the bacillus of leprosy may be conveyed either in or on the insect.

Bassewitz also cites a case where, in all probability, leprosy was conveyed by the parasite of scabies from a leper to his attendant. The incubation period was two and a half years.

Classification and Symptomatology. Leprosy, according to R. H. Bibb[9], is divisible into tubercular, anesthetic and mixed leprosy. Leprosy, as a rule, is a disease of slow progress. Sometimes, however, it is exceedingly rapid; but in the vast majority of cases its early mani-

(9) Amer. Jour. of Derm., August, 1911.

festations are vague and indefinite and its earliest symptoms may be overlooked or attributed to some minor ailment, and years may pass before the serious nature of the malady is suspected, or before mutilation or deformity occurs and makes a diagnosis possible. Fever, more or less intense, and more or less erratic, is an invariable early symptom of leprosy. It may recur for a number of years and may, in malarial districts, be regarded as due to, and be treated for malaria, especially by those who do not use the microscope. It has been mistaken for tuberculous and syphilitic fever. General malaise, weakness, heaviness, excessive sweating and an irresistible desire to sleep, are common in the early period of leprosy. Dyspeptic derangements, such as diarrhea in some, constipation in others, epistaxis, dryness of the nostrils, headache, vertigo, perversions of sensations, localized pruritus, hyperesthesia, a sensation of pins and needles, neuralgic pains, mostly intermittent, rheumatic pains in the face, back, loins and limbs, generally severe; any one or all of these symptoms may for years, announce the oncoming of leprosy; and yet no one of them nor all combined, is distinctive of the disease.

After a longer or shorter period of ill health, generally longer, and after, as a rule, the symptoms already enumerated, especially the fever and rheumatic pains have been unusually severe, an eruption appears somewhere on the cutaneous surface, most frequently perhaps upon the face, also upon the superciliary region, cheeks and ears, the dorsum of the hands, back, buttocks, abdomen and chest. The palms of the hands, the soles of the feet and the scalp are said never to be attacked. This eruption, which is strictly macular, varies in different individuals in size, number, duration and other features. It may be composed of spots as small as a millet seed, or they may be several inches in extension; they may be numerous, or limited to two or three; they are erythematous, disappear on pressure, are darkest in the center and shade off towards the periphery. They may be pigmented; they may be vitiliginous; or all three forms—erythematous, pigmented and vitili-

ginous—may occur in the same patient. In some cases, what was the primary erythematous eruption becomes pigmented, sometimes pallid, with partial atrophy of the cutis. In some, the center of the erythematous area assumes a whitish aspect, the periphery remaining red or becoming pigmented, so that the macule becomes a red or pigmented ring enclosing a pale, anesthetic center. Not infrequently these changes in the maculæ are preceded by paresthesiæ, burning, pricking, tingling, etc. Occasionally the maculæ fade out in a few days, weeks or months; but as the disease advances and new ones appear, they become more permanent, more liable to pigmentation and more anesthetic.

The affected skin, in all leprous eruptions, soon loses its hair, and its sweat function is abolished or becomes greatly lessened. The loss of the eye-brows is a very early and characteristic symptom, so that one living where leprosy is endemic is very prone to think of the disease on meeting one who has lost this facial adornment and useful provision of nature.

During this period no thickening of the skin and no new growth can be detected; but sooner or later, another manifestation is noted which is characterized by the growth of a tissue possessing well-marked specific characters—the leproma. This growth or deposit occurs in either the skin, or in the continuity of the peripheral nerve trunks, or in both. If in the first situation, tubercular leprosy is the result; if in the second, anesthetic leprosy; if in both situations, mixed leprosy is produced. Tubercular leprosy, after a longer or shorter prodrome often without a well-marked macular period, but usually after a severe fever, is frequently characterized by a rapid development of the lepromata upon the face or other portions of the body. Sometimes a well-defined macular stage, as in anesthetic leprosy, but of shorter duration, precedes the appearance of the nodules which constitute the essential lesion in this form of leprosy. The dimensions, combinations, situation, growth and decay of these nodules, "give rise to the more manifest symptoms of the earlier stages of the disease."

The leproma (adopting the description of Manson, it being superior to any), is formed by infiltration of the deeper layers of the derma with what is at first a small-celled, somewhat dense neoplasm. As this slowly or more rapidly increases, it forms a prominent, rounded boss or protuberance covered with unbroken epidermis. In size it ranges from that of a split pea, to a great plaque many inches across. In color it is different according to age and condition, and according to the natural hue of the skin of the leper; it varies from red to dirty pink in the earlier and congestive stage, to a dark brown or dirty yellow in the later stages. It is generally, though not always, especially at first, anesthetic to some degree, if not absolutely so; it is devoid of hair, usually somewhat greasy-looking and, perhaps, stippled with gaping follicles. Although not so hard as cheloid, it is fairly firm to the touch, and unless very extensive, can be readily raised up and freely moved over subjacent structures. Isolated lepromata are usually round or oval; when contiguous they may coalesce, forming patches of irregular outline.

When many lepromata run together, the growth causes the natural folds of the skin to be exaggerated; and thus great disfigurement, especially of the face, may ensue. Thus the skin of the forehead and eyebrows —an early and favorite site of leprous infiltration—is thrown into massive folds which overhang the eyes; the fleshy part of the nose broadens out; the cheeks become massive; the lips are thickened and protrude; the chin is swollen and heavy; the external ears are thick and pendulous; and the bloated, dusky, wrinkled, greasy, passive countenance acquires the repulsive appearance very appropriately designated "leontiasis."

Nodules appear in more or less profusion on the limbs and body; most generally upon backs of the hands, the outside of the arms, wrists, thighs and groins. On the body they are not so prominent, but may form extensive plaques. On the limbs the infiltration is usually dusky, diffused, ill-defined, and prone to ulcerate; but is not as prominent as it is on the face and hands.

As a rule, and coincident with a return of leprous

fever, new tubercles appear. Sometimes, especially during an attack of some of the exanthems, erysipelas or phthisis, many of the nodules disappear, leaving but faint traces behind; but the normal course of the nodule is to soften in the center and to be absorbed, leaving a smooth circular patch of scar tissue; or, after softening, to ulcerate and discharge a sticky, yellow pus. When the ulcer heals, an irregular, depressed scar results.

The eyes, nose and mouth, sooner or later, are invaded by this form of leprosy. The conjunctiva, cornea, iris and ciliary bodies, one or the other, or all, are attacked and the organ ultimately destroyed. The nasal cartilages ulcerate, break down and discharge a foul-smelling pus. The contour of the nose is awfully multilated. The glottis, the epiglottis, pharynx, tongue and mouth generally, are very frequently sites for lepromata and subsequent ulcerations. The larynx may become so stenotic as to require surgical attention, and the lips may become adherent so that an operation upon them may also be necessary. When the tongue is involved the sense of taste is soon lost.

In this way, with the exception of hearing, one sense after another is lost forever. Ulcers, from breaking down of the tubercles and from traumatism to the insensitive skin, form everywhere. The lymphatic glands of the neck, axilla and groin suppurate and become fistulous. The liver and intestine undergo amyloid degeneration; and often an intractable diarrhea, due to these causes, occurs at this stage and relieves the unfortunate victim of his miseries. Should the patient live, in addition to his present troubles, more terrible sufferings await him. The nerve trunks are attacked and neuralgic, paretic and trophic nerve lesions are superadded. The fingers and toes ulcerate and fall off, or become atrophied and distorted, or the phalanges are absorbed and the hands and feet become cumbersome stumps. Altogether, the blind, lame, unhappy wretch —still retaining his intellect, but devoid of every other sense except that of hearing, breathing with difficulty through a stenosed larynx, eating, perhaps, through a narrow slit between the lips, and racked by neuralgic

pains and irregular outbursts of fever unless carried off by some intercurrent affection, which mercifully, is the rule—comes to present, before the inevitable death from exhaustion occurs, a sadder, more loathsome, and a more repulsive picture than anything the most vivid imagination can conceive.

Such, however, is not the end with all lepers, for some reach the condition just described and instead of dying, the disease begins to wane and its victims, though disfigured out of all human semblance, with sightless eyes, fingerless hands and toeless feet, begin to improve until every ulcer is healed, every nodule is absorbed and every pain is eased, and in this condition they may live for many years and finally die of some intercurrent disease.

In anesthetic leprosy, the prodromic and macular stages may be slight, severe or entirely absent. As a rule, and more frequently than in tubercular leprosy, nervous manifestations are preceded by a longer and more definitely marked macular period involving large areas of skin, which may be either in erythematous, pigmented or vitiliginous patches. Sometimes the eruption is circular in form and constists of "a red, congested, slightly elevated and, perhaps, hyperesthetic border enclosing a larger or smaller area of pale, anesthetic, non-sweating integument," not unlike the eruption of ringworm, for which it may be mistaken. These eruptions may be permanent, they may spread, and they may come and go many times before the more pronounced and graver symptoms of anesthetic leprosy make their appearance.

Bullæ—*pemphigus leprosus*—are very frequent at this stage of the disease and constitute a very distinctive feature of this type. They appear suddenly upon the hands, feet, knees, thighs and on other parts of the body. They vary in size from a lentil to two or three inches in diameter. They rupture in a day or so, disclosing a reddish surface which crusts over, exfoliates, and leaves a pale, anesthetic spot with a well-defined, pigmented edge. They sometimes ulcerate. If another bulla happens to form near an ulcerating one, the two may occasionally coalesce to one large serpiginous-looking sore.

As the disease advances the severe neuralgic pains, formication, hyperesthesia, or anesthesia become more marked. The lymphatics enlarge, and the fever goes higher. Up to this point the skin symptoms have been most in evidence, and they may remain, or they may disappear. Be that as it may, symptoms of profound peripheral nerve involvement assert themselves at this stage; the neuralgic pains increase, the anesthesia, paresthesia, and trophic changes in the skin, muscle, and bone, the result of nerve destruction, "become the dominating elements in the case." It is also at this stage that the ulnar nerve, if carefully examined where it passes around the internal condyle of the humerus, will be found hard, and greatly enlarged, often to the size of the little finger. The anterior tibial, the peroneal, and, more rarely, the median, radial, brachial and cervical nerves will be found equally implicated. "By degrees," using Mason's language, "the thickening of the nerve trunks decreases somewhat, the hyperesthesia and neuralgia subside, and anesthesia, paresis, muscular atrophy and other trophic changes takes their place. For a time the condition may fluctuate; the neuritis apparently may come and go with corresponding changes in the condition subserved by the affected nerves. Sooner or later, however, fibrous changes ensue in the neural leprous deposits, and the nerve tubules ultimately atrophy and disappear. The nerve tissue is now irreparably damaged, and trophic changes steadily advance. In other instances anesthesia comes on without hyperesthesia, without constitutional symptoms, without discoloration of the skin, the patient discovering its existence by accident.

"In nerve leprosy the anesthesia begins most commonly in the feet, the thighs, hands, arms, forearms, and face. Later, and more rarely, it affects the trunk. The anesthesia, though associated with well-marked lesions of the larger nerves, does not always, or even as a rule, coincide accurately with the anatomic distribution of their terminals. Another, and sometimes a very striking fact in nerve leprosy is the symmetry observed in the distribution of some of the anesthetic areas. This

symmetry is by no means invariable; in not a few cases, however, it is very perfect and remarkable.

"At the outset the anesthesia in the affected patches may not be absolute; it may also come and go; it may be very superficial, deep pressure being for a long time appreciable. But when the anesthesia becomes as it were, settled in a part, it seems gradually to extend deeper into the tissues; so that after a time it is absolute, and the parts may be pinched, incised and even seared with fire, and the leper be absolutely unconscious of pain or even of being touched.

"Step by step with the progress of the anesthesia, atrophy of the subjacent muscles supplied by the thickened nerves, proceeds. Along with the atrophy there is corresponding distortion and corresponding loss of power. There is no ataxia or inco-ordination of movement, simply feebleness. Thus the forearm wastes, the grasp is weakened, the thenar and hypothenar eminences and the interossei melt away, and the *main en griffe* or some such deformity is gradually produced. Similar changes occur in the legs and feet, so that the power of walking is much impaired. The muscles of the thighs and the upper arm, the pectorals, and the muscles of the face follow suit very much as in progressive muscular atrophy, only in the latter disease there is no superjacent anesthesia.

"In the affected nerve area all the muscles are not simultaneously or equally attacked, so that, especially in the face, curious distortions may ensue. These facial atrophies, whether symmetric or one-sided, in time produce a facies as characteristic of nerve leprosy as leontiasis is of nodular leprosy. Owing to muscular atrophy the eyes after a time cannot be closed; the upper lid droops, the lower lid becomes everted, and the eye itself may become fixed. At first, owing to exposure of the organ, there is lacrymation; but by and by the secretion of tears dries up, the congested conjunctiva becomes cornified, the cornea ulcerates or turn leucomatous, and, in the end, sight is entirely lost. Ulceration often occurs in the mucous membrane of the nose, as in nodular leprosy, the septum being destroyed, and the tip of the

nose may fall or be entirely lost. The lips may become paralyzed, interfering with articulation and permitting the saliva to run from the mouth in a constant stream. The gums may retract, exposing the maxillary bone, the teeth ultimately dropping out. Anesthesia of the buccal mucous membrane, and implication of the muscles of mastication, may render eating and articulation difficult.

"In time the skin of anesthetic patches on the limbs tends to atrophy; it loses its glands and hairs, and, in the end, may become so thinned and tense that it actually bursts into long cracks. The nails are not generally shed, but they become rough, or thinned, or atrophied into minute hook-like appendages. Ulcers form over exposed parts of the hands and feet. They may penetrate and disorganize the joints, and cause the fingers and toes to drop off. Or, perhaps, an abscess forms around a phalanx, destroys the periosteum, and ultimately leads to loss of the bone. Or, dry gangrene may amputate finger or toe. Or, there may be absorption of one or more of the phalanges. It is no unusual thing to see on a leper's hand a finger in which one or more of the phalanges have been lost without destruction of the fleshy part. Perforating ulcer of the sole of the foot, usually under the ball of the great toe or the heel, is a very common lesion in nerve leprosy.

"The advance of nerve leprosy is much slower than is that of the nodular variety. The average duration of the latter is from eight to nine years, of nerve leprosy from ten to twenty-five years. In both varieties they often live to thirty or forty years. The end of nerve cases is as sad and repulsive as it is of the nodular form. Death is seldom due to the disease itself; diarrhea, chronic nephritis, phthisis, pneumonia, or bronchitis being, one or the other of them, usually the immediate cause of death."

In most cases of nodular leprosy, trophic changes from implication of nerve trunks ultimately supervene. Similarly, though not so frequently, nodular infiltration of the skin may appear in the course of what originally seemed to be a case of nerve leprosy. In yet other cases

nodular and nerve lesions concur from the outset. In one or other of these ways what is known as mixed leprosy is produced. The lesions are in no wise different from those already mentioned; therefore, this form of the disease does not require a more detailed description.

The pathology of the two forms of leprosy has been given in detailing their symptoms, so that it will suffice to state that if a leproma be hardened, cut, stained, decolorized and examined under the microscope, it will be found to consist of small round cells, the size of a leucocyte, epithelioid cells and fusiform cells, the latter two predominating in old cases. These cells will be seen to have infiltrated and partially disassociated all but the most superficial layer of the derma. As a rule they are arranged in groups around the blood-vessels, and are, some of them, literally crammed with the *Bacilli leprœ*. In addition to the bacilli-bearing cells, a number of brown granular bodies, called "globi," will be found. These "globi" are thought to be cells in which the bacilli have died and become granular. The brown color of the lepromata is due to the "globi."

The histology of the infiltrated macula is the same as that of the leproma, the number of bacilli, lepra cells, and globi being fewer. In old maculæ and in old lepromata, the bacilli may be absent or undiscoverable. The terminal nerve fibers are degenerated in nerve leprosy. The nerve thickening is a secondary inflammation, consequently containing but few bacilli after the disease has progressed; but in the beginning bacilli may be found in the cells, between the tubules, and in the tubules themselves. With time, the affected nerves become mere fibrous cords destitute of nerve tubules.

The liver and spleen in some cases of nodular leprosy are affected by a peculiar infiltration which may be seen by the naked eye in well-marked examples. This infiltration consists of fine white dots and streaks in the acini; this is a new growth and contains the bacilli. The bacilli are never found in the liver cells. The testes atrophy and become fibrotic in nodular leprosy. Bacilli and globi are found around the tubules, free and in the

cells. The lymphatic glands in parts involved in the leprous process are affected in all forms of leprosy. They become inflamed, are hard, and on section the gland tissue is found with a yellow tinge from infiltration with the bacilli and globi. In a large proportion of cases of nodular leprosy, nephritis and albuminoid degeneration of the alimentary canal, liver and spleen occur. Anesthesia is so rarely absent in leprosy, especially in the implicated spots where it is often complete, that Manson regards its presence or absence in some skin lesion, or in some skin area as the touchstone in all doubtful cases. As a rule, it is most pronounced in the center of the maculæ, in the pale patches left after fading of the maculæ, in the hands and feet, and in nodules of long standing. In no other skin disease is anesthesia a marked symptom.

Diagnosis. Leucoderma, which is sometimes confounded with true leprosy because of its resemblance to the post-macular spots, may be excluded by the absence of anesthesia, and by the fact that the skin perspires. The presence of a macular eruption, thickened nerve trunks and enlarged lymphatic glands in leprosy and their absence in syringomyelia, is enough to exclude the latter. Syphilis, erythema multiforme, erythema nodosum, lupus vulgaris, lupus erythematosus, psoriasis, eczema, lichen planus, cheloid, ringworm, erythrasma, pityriasis versicolor, elephantiasis, etc., can be taken for leprosy only by the careless. In all patients showing dermatoses, especially those coming from countries where leprosy is endemic, wherever a doubt arises, search should be made for the bacillus, which, if identified, is sufficient to establish the diagnosis beyond question.

In nerve leprosy it is the rule for fresh leprous infiltrations to cease, for old ones to be absorbed, and for the bacilli to die out. Many of these cases live forty or fifty years as repugnant specimens of mutilated humanity, to die of another cause. Nodular leprosy, a more acute affection, may run as acute a course as acute phthisis, the patient dying within a year. Victims of nodular leprosy rarely live longer than eight or nine

years, and usually die of phthisis, nephritis, albuminoid degeneration of the alimentary tract, dysentery, stenosis of the larynx, or pneumonia.

Paget's Breast Eczema. J. Hirschel [1] is of the opinion that every chronic eczema of the nipple should be treated and observed with the greatest possible care, and that when the diagnosis is uncertain a portion should be excised for examination, because there may exist in the mamma a small carcinoma which has secondarily produced the eczema, a permanent cure of which may be expected from early extirpation. Paget's idea that carcinoma originated from the eczema is the exact opposite of the truth. The carcinoma is primary in these cases.

Erythemata and Joint Lesions often coexist, according to A. F. Garrod,[2] in the course of attacks of rheumatic fever. This suggests that where they occur together both are of rheumatic origin. Further study shows that such an explanation does not suffice, nor is one justified in assuming that arthritis which accompanies an erythema is always rheumatic. These allied affections may have their origin in a number of different causes. Even in rheumatic fever the marginate and papular erythemata, which are perhaps commoner in children than in adults, are more closely associated with the articular than with the cardiac manifestations of the disease, whereas other rheumatic accidents, such as chorea and subcutaneous nodules, group themselves around the endocardial and pericardial lesions. Such associated lesions of skin and joints are also seen in erythema nodosum. The nosologic position of this erythema is open to doubt. The pains which accompany it are by no means always articular.

Erythema Multiforme During Typhoid is discussed by H. P. Parker and H. H. Hazen [3] who state that erythema multiforme is frequently spoken of as occurring in typhoid, but they have been able to find only two instances where the eruption occurred during the course of the fever, the cases of Lauffer and Goldstein;

(1) Münch. med. Wochenschr., Dec. 13, 1911.
(2) Lancet, May 27, 1911.
(3) Amer. Jour. of Derm., March, 1911.

Peter's case developed the lesions during his convalescence. Many writers of whom Da Costa, and Hutinel and de Gimard may be taken as fair samples, speak of measley and of scarlatinoid eruptions. In a study of 1,500 cases of typhoid fever at the Johns Hopkins Hospital, McCrae notes erythema as occurring 15 times, urticaria twice, purpura 38 times and a pemphigoid eruption once. Thus it will be seen that true cases of erythema multiforme in the course of typhoid are very few.

A fourteen-year-old boy, mulatto, was admitted to The Freedmen's Hospital on November 5, 1909, complaining of a burning feeling in his eyes, severe headache, great weakness, bleeding from his nose, and a slight cough. His family history was unimportant, his father, mother and two brothers having died of unknown causes, and his remaining brothers and sisters being in good health. The patient had suffered from measles, mumps, malaria, and rheumatism, but from no other complaints, though he had had some vague indigestion, and some abdominal pain at night. He was accustomed to drink coffee and a little beer and whiskey, but otherwise his habits were good. The present illness began two days before admission with severe headache, which disappeared shortly to be replaced by a burning sensation about the eyes. He had to take to his bed at once. On the following day he had a severe chill, and in the evening nose-bleed. There was some slight cough.

On admission to the hospital the following notes were made: "The patient is a well-built, well-nourished boy; the facial expression is dull and heavy; the pupils are equal and react to light and accommodation. The tongue is covered with a heavy fur; the pulse is 108 to the minute, regular in force and rhythm, of good volume and tension. The chest is well-formed and symmetrical; the breathing is costo-abdominal in type, 28 to the minute. On percussion and auscultation both lungs are clear throughout. The heart is not enlarged either to the right or the left. The heart sounds are clear and forcible. The abdomen is not distended; it is everywhere soft and tympanitic; the liver is not enlarged, but

the edge of the spleen is felt two fingers' breadth below the costal margin. The knee-jerks are present."

On admission the temperature was 103° F., and during the illness ran between 100.8° F. and 103.8° F., the pulse from 80 to 115, and the respirations from 25 to 30. Typhoid fever was suspected because of the history and initial symptoms, the continued high fever, and the facies. The patient was given an initial purge, and was put on six ounces of milk every four hours, alternating with albumin every four hours. An ice-cap was put to the head and he was sponged every three hours when the temperature rose to 102° F. or higher. An enema was given every second day. Six ounces of water were given every two hours. Typhoid fever isolation was carried out.

Two days after admission the patient showed over the back of his right hand and the extensor surfaces of his forearms a number of roughly circular, bluish patches about ½ cm. in diameter. Careful examination showed no rash on any part of the body with the exception of a few small rose-colored patches on the abdomen and lower chest that disappeared on pressure. Later in the day the following special note on the skin condition was made: "On the hands and forearms, both surfaces, extending half way to the elbow, the fingers, the dorsal surfaces of the feet and the shins there are two varieties of lesions, one of which is macular, ill-defined and varying in size from ½ to 2 cm. in diameter; the center is red and the periphery is whitish. The edge is very well defined. On the extensor surfaces of both forearms there are scattered areas or spots that are free from pigment but having a hyperpigmented areola. The proximal finger-joints seem slightly swollen, and are bright-red in color, the general appearance being similar to the erythematous areas on the arms and legs." The patient had suffered every spring for four years from an eruption similar to the present one, save that the lesions became vesicular and burst, leaving white scars.

The urine had a specific gravity of 1,026, and showed a trace of albumin but neither casts nor red blood cells.

The leucocytes numbered 4,400, and a differential count of 500 cells gave:

Polymorphonuclears	66.6%
Eosinophiles,	0.4%
Large mononuclears,	1.0%
Small mononuclears,	29.6%
Transitionals,	2.4%

No mast cells or myelocytes.

The Gruber-Widal reaction, 1 to 50 for one hour, was negative. The blood pressure was 110.

Two days after the last note, the carpo-phalangeal joints of both hands were red and swollen, and there were a few reddish macules on the proximal phalanges; the annular lesions still persisted on the forearms and backs of the hands and on the feet.

Ten days later there remained only a few annular lesions on both hands and feet. The temperature had now been normal for five days. He left the hospital three weeks and a half after admission, with the annular lesions still persisting. Blood cultures and cultures from the annular lesions were alike sterile. A Widal reaction, found just before he left, was suggestive.

Owing to the short duration of the fever, the absence of the Widal reaction, and the marked cutaneous symptoms it was questionable whether the patient was suffering from typhoid fever complicated by erythema multiforme, or from one of the severe forms or erythema with enlargement of the spleen, joint symptoms and continued high fever. In favor of typhoid fever were the continued high fever, the mental dulness, the coated tongue, and the low leucocyte count. Against typhoid spoke the abrupt onset, and the short duration of the fever, the absence of the Widal reaction and the negative blood culture, although the latter was taken rather late. The other symptoms and physical signs, including the differential count, could have occurred with either disease. A definite diagnosis was not made.

December 6, one week after his discharge, the patient was again admitted to the hospital. His temperature was 103.5° F., pulse 110, and respiration 30. On the 9th it was noted that the patient was having bloody ex-

pectoration. On the 18th he had a rather free epistaxis in the morning and also coughed up a considerable amount of blood, which might of course have come from the nose. On percussion the lungs were clear throughout, but on auscultation there were numerous sibilant râles at the bases, both front and back. Over the chest, abdomen and back there were some pinkish macules about 1 mm. in diameter, and a few other papules that resembled acne lesions. There were no new lesions of erythema multiforme, but the old annular lesions still persisted.

December 22nd the patient had a sudden rise of temperature, the temperature previously having fallen almost to normal. Examination showed dulness in the lower axilla, and impairment of expansion over the same area. Over the right base in front, and over the whole back there were numerous sibilant râles at the end of inspiration. There was no alteration of the breath sounds. These physical signs were similar to those usually found in pneumonia accompanying typhoid fever. On the following day the temperature again dropped, and after the 29th there was no fever. Three weeks later the patient was discharged. He still had the annular lesions on the hands and feet, but they were now fading. The same annular lesions persisted from November 7, 1909, to January 22nd, 1910, an unusually long duration for the annular lesions of erythema multiforme.

It is certain that the patient had typhoid fever during his second stay in the hospital, and practically certain that he also was suffering from the same disease during his first admission. During the height of his first attack he had the following symptoms characteristic of the erythemas: annular and macular skin lesions, and swelling and redness of the carpo-phalangeal joints. During the height of his relapse he suffered from edema of the upper lip (giant urticaria), erythema at points of pressure, and hemoptysis. The fact that these lesions occurred only when the infection was young and active seems to indicate that a typhoid toxemia was their cause.

Purpura Hemorrhagica is reported by G. Stumpke,[4]

(4) Berlin. klin. Wochenschr., June 5, 1911.

marked not only by extremely profuse superficial and deep hemorrhages into the skin, but also by large sugillations of the mucous membranes which at one time threatened life directly by stenosis of the larynx. In addition there were hemorrhages in other parts of the body associated with symptoms of inflammation of the joints, kidneys and bronchi. In spite of the extremely grave symptoms the disease followed a benign course, and a complete *restitutio ad integrum* followed even the most extensive sugillations in the skin, with the transition stage of pigment deposit, while a hemorrhagic infarction took place in the mucous membrane with a secondary necrosis, probably favored by the bacteria in the mouth, which resulted in a considerable loss of tissue. In this case the purpura hemorrhagica probably started from the tonsils.

Exanthemata, according to A. Phillips,[5] are decreasing in mortality in Great Britain. There has been a fall of 73 per cent. in fifty-eight years. Scarlet fever has decreased 91 per cent. in forty-eight years. There seems to be little doubt that this disease is communicated through desquamated scales and aural and nasal discharges. One of the commonest complications is rheumatism, followed by endocarditis or chorea. Albuminuria should be taken to indicate nephritis.

As to measles, its seriousness is greater from the debility and the glandular and pulmonary affections that may follow it; it is extremely infectious, as much so as smallpox. Collapse of the lung is not uncommon. It is often impossible to differentiate it from German measles. Koplik's spots are the surest index. Pityriasis rosea is sometimes deceptive. Typhoid fever is much milder than formerly. All the exanthemata may occur during pregnancy, but healthy children may be subsequently born. Hyperpyrexia is serious in adults, when it is always due to some complication, but is not dangerous in children. The coexistence of two exanthems is not rare, scarlet fever with measles or chicken-pox, or even with typhoid fever, both rashes appearing simultaneously. Mumps is not uncommon with scarlet fever. Such association tends to severity of symptoms.

(5) Lancet, May 27, 1911.

Varicella Complicating Scarlatina is reported by V. Hutinel.[6] The scarlatinal effects were chiefly in the throat and mouth. The mucosa sloughed off at several points with general symptoms of septicemia, rapidly proving fatal. The viscera were found practically sound, but the thyroid, suprarenal capsules and pituitary body showed marked lesions entailing defective functioning. The symptoms of the varicella and of the ordinary scarlatinal syndrome were comparatively mild. Hutinel has encountered this combination in 20 previous cases, none showing any signs of excessive virulence on the part of either infection.

The extreme virulence in the case reported was evidently due to the influence of the scarlet fever on the ductless glands. The author has seen a case of acute inflammation of the suprarenals during scarlet fever in a little girl who recovered, and Tixier found both suprarenals destroyed by hemorrhages and the pancreas gravely affected at the necropsy of a child succumbing to malignant scarlet fever. Comby has since encountered a similar case except that the pancreas was intact. Hutinel believes that scarlatinal lesions in the ductless glands modify the blood and this in turn permits streptococci to enter the blood. In other cases the liver may be the organ to feel the influence of the scarlatinal infection most severely. Treatment should be guided by indications as to which internal organs are bearing the brunt, and those organs should be relieved, the liver if there seems hepatic derangement, the suprarenals if they be at fault. Here epinephrin may be indicated. In either case, baths to reduce temperature, and means to cleanse the throat and to sustain the heart may all prove useful.

Papules of the Buccal Mucosa which may resemble Koplik's spots are according to H. K. Gaskill[7] those due to Fordyce's disease, aphthous stomatitis, lichen planus, mucous patches, sprue and thrush.

Lichen Planus and Pernicious Anemia. A. Spielhoff[8] reports the case in a 60-year-old woman ill for six

(6) Arch. de Méd. des Enfants, March, 1911.
(7) N. Y. Med. Jour., July 22, 1911.
(6) Arch. de Méd des Enfants, March, 1911.

months, complaining of a pruritic eruption. She was anemic and had a waxy appearance. There were hemic cardiac murmurs, and typical lichen planus papules more or less all over the body, and on the tongue. The blood examination showed: Erythrocytes, 1,344,000; white blood-corpuscles, 1,500; hemoglobin, 30 per cent; color index, over 1. The differential count showed: Polymorphonuclears, 26.8 per cent.; eosinophiles, 2.4 per cent.; myelocytes, 5 per cent.; large mononuclear cells, 6 per cent.; lymphocytes, 59.9 per cent.; gradation forms, 4 per cent. Among the red blood-corpuscles were normo- and megaloblasts, basophilic granules and polychromatic cells. In spite of treatment with arsenic the patient died a few weeks later.

Trophic Ulcer of the Foot in an hysteric 36 years old, with a long surgical and dermatologic history, is reported by C. J. White.[9] She had an adolescent stress with all the exanthemata. During that period five brothers and sisters died in childhood, three from phthisis. A persistent affection of the foot dated back twenty-four years. It began like chilblains, followed by atrophy and ulceration and total destruction of the toes. until all had fallen off progressively from the big toe outward. The present trouble consisted of an ulcer on the dorsum of the foot, accompanied by great pain, but controllable by hot water. The ulcer responded well to treatment and was nearly healed in sixteen days.

Progressive Ossifying Varioliform Dermatitis in the course of a diffuse progressive ossifying myositis is reported by R. Horand.[1] The little girl had on her hands varioliform pseudo-pustules. The tumors were on the dorsal surface of the hands and the anterior forearm. They were millet size. The largest were bean-sized. Some were present on the articulations of the second metacarpal bone with its phalanx. They were umbilicated, white in the center, and surrounded by a fine rose circle. The tumors were hard and calcareous, of a special stony nature. Their base was infiltrated like the base of big warts. The greater were not round, but dotted with nipple-like projections. The tumors ap-

(9) Jour. Amer. Med. Assoc., June 1, 1911.
(1) Lyon Méd., Jan. 2, 1911.

peared in successive crops. They were opened at their onset and either disappeared or reformed. Some which appeared at the fold of the labia majora disappeared after some months spontaneously. They at times ulcerated. The largest on the hand, when opened, showed a pasty plaster-like mass; but it healed just as a sebaceous cyst heals when the steatogenous membrane is not removed. The smaller tumors seemed to contain chalky material (lime carbonate and phosphate). Urates as in tophi were not to be detected. The tumors involved the epidermis, dermis, and subcuteaneous cellular tissue. Osseous tumors existed also deep down in the subjacent tissues.

Radiography showed that the *x*-rays did not penetrate. Glandular engorgement was not present. Inoculation and bacteriologic analyses were without result. The tumors appeared to be due to degeneration and calcification of the sudoriparous glands, their arterioles and the adipose lobules. The patient six years previously (then a girl of 7½ years) had her first tumor after a fall from a school window. She went through the regular phrases of progressive ossifying myositis thereafter. This first involved the left trapezius and during seven years spread to other muscles.

Chronic Subcutaneous Fibrosis. R. Stockman,[2] after an analysis of the literature and his own cases, arrives at the following conclusions: Chronic inflammation of the subcutaneous connective tissue is a very common affection. It is secondary to various acute and chronic infections. Implication of the small peripheral nerves in the chronic inflammatory process gives rise to sensations of aching, stiffness, numbness, fatigue, etc. When persons already stout or who afterwards become so are affected, the fat tends to form larger or smaller masses around the hypertrophied connective tissues. These masses are often very painful on pressure owing to the interstitial neuritis of the nerve twigs. The fatty masses are deposited mostly in the ordinary situations of fat accumulation. The condition described by Dercum as adiposis dolorosa cannot be ranked as a special disease.

(2) Brit. Med. Jour., Feb. 18, 1911.

Woody Phlegmon of the Neck, according to C. A. Powers,[3] is infrequent. It is generally seen in men depreciated in general health, over 45 years of age. The patients are generally free from intercurrent disease. There is generally an antecedent infection of the tissues of the mouth, pharynx or salivary glands. The condition is essentially chronic. It generally simulates carcinoma or sarcoma or actinomycosis. The general tendency is toward recovery. Fatalities may occur through edema of the larynx or through pressure or through diffuse extension and exhaustion.

Foci of suppuration should be induced in all possible ways. Warm, moist compresses are undoubtedly of value. Free incisions may be made. Excision of wide areas of board-like tissue should be practiced in suitable cases. The general health should be brought up to the highest possible point. According to Reclus, this peculiar anatomic reaction can be provoked by any pathogenic germ, not only by the ordinary agents of suppuration, but also by the fungi (actinomycosis, sporotrichosis) the gregarines, etc. This anatomic reaction, characterized essentially by the production of fibrous tissue, may be found in regions other than the neck; for example, around the kidney. The so-called perinephritic sclerosis is practically a ligneous phlegmon.

Ochronosis as a Familial Disease has been reported by Kolaczek[4] in three sisters. There are 26 clear-cut cases of this dermatosis on record. Sixteen had alkaptonuria. There was also ear discoloration and hardening and sclerotic macular grayness; less frequent were blueness of the nasal cartilages, a comedoid facial appearance, brownish palate, black ear-wax and green axillary perspiration. On necropsy bone and cartilage and cardiovascular changes were found. The three cases of Kolaczek were in sisters aged between 30 and 46. Thirty-five persons of the same family covering three generations had neither alkaptonuria nor ochronosis. The parents of the sisters were first cousins. The familial origin is not very apparent since no relation to stress

(3) Jour. Amer. Med. Assoc., July 29, 1911.
(4) Münch. med. Wochenschr., Apr. 25, 1911.

periods has been traced. Marriage of cousins doubles defects, but does not originate them.

Oyster Shell Nails are described by L. K. Hirshberg [5] as a chronic non-fungoid disease of the nails. He reports a case in a 32-year-old Virginian who for 11 years had troublesome hardness and brittleness of finger nails. Since childhood, the only disease was a chronic (non-tuberculous) cough. Physical examination showed a sparely built, tall blonde. Examination of the sputum for tubercle bacilli and of the chest for tuberculosis gave negative results, but created suspicion of bronchiectasis. The heart was negative, as were also the abdomen, pelvis, and extremities. The blood exhibited only a moderate leucocytosis, with 92 per cent. of polymorphonuclear cells.

The fingers were long and tapered. The nails were markedly convex, lustreless, smaller than the tapered ends of the fingers; *i. e.*, they were so raised and prominent in their convexity that a conspicuous line of the flesh beneath made a border of the finger itself project out from 2 to 4 mm. all around. These striking margins made the morbid matrix appear shrunken. Even the nails that were not involved much, as the ring and little finger of the right hand, had this shortened, curved effect. There were periods when all nails seemed smooth, but not absolutely normal. Then they were like these two fingers just mentioned. Such a condition had occurred four or five times in eleven years. There was no clubbing or other finger malformations, like those found usually in emphysema, tuberculosis, bronchiectasis, and chronic cardiac disease.

The nails were pale amber. Striations, waves, folds, craters, hillocks, irregular crests and other vagaries were conspicuous over the thickened portions of the nails. On no nail was the entire surface involved. Either one-third of the new part of the nail was affected, or about one-third to one-half of the peripheral portion was concerned in the process. The corrugations on the nails were not altogether unlike those of an average osyster shell. The nails were not transparent, and

(5) Amer. Jour. Derm., August, 1911.

were compactly curved with the sharp concavity toward the integument beneath. There was some little tenderness not constantly present; but no real pain. The nail in the dense, thickened parts seemed crowded into itself. In these places it was brittle; but gave one the impression of brittle volcanic lava, *i. e.*, as if it had been soft and had run partially together in uneven ridges while setting as it became hard. Sections, cultures, stains, and inoculations into dogs and guinea pigs have thrown no additional light on this case.

Sporotrichosis is reported by W. B. Steward[6] in a 42-year-old II-para of healthy antecedents. A month previous to her visit to Steward a roundish, slightly nodulated papule was noticed at the middle of the lower third of the internal surface of the right thigh. There were no subjective symptoms, excepting a pricking, uneasy sensation. This nodule gradually enlarged to the size of a hazel-nut, other nodules appearing one at a time until there was a chain of seven in number, only two breaking down. There was no grandular enlargement, systemic disturbance, impaired function or any other lesion found. The ulcer was 4 cm. long and 3 cm. wide and 3 or 4 mm. deep; the surface of the ulcer was irregular and of a reddish brown color, covered with a thick, grayish, tenacious pus. Four cm. above the primary lesion was another nodule which broke down, causing a similar ulcer, although smaller in size. The areola of hyperemia which usually surrounds an inflamed wound was quite narrow, the edges of the ulcer were thickened and undermined and of a reddish blue color. The line of junction of diseased and normal skin was quite clearly marked. The remaining nodules were uniform in size and evenly distributed up the thigh, very superficial and with no fluctuation. None of these lesions was painful or tender to the touch and no connecting link or extending red streaks were visible. The ulcers were dressed with antiseptic dressings. The patient was put on increasing doses of potassium iodid. The nodules disappeared and the ulcers healed very readily, leaving practically no scars.

(6) Jour. Amer. Med. Assoc., Aug. 5, 1911.

Sporotrichosis Resembling Tuberculosis. Jeanselme, Chevallier and Darbois[7] cite cases illustrating the mimickry of tuberculosis by sporotrichosis. It gives rise to false white swellings, for example, and spina ventosa. A periosteitis is not at all uncommon. Syphilis also presents difficulties of differential diagnosis.

Alopecia. From an analysis of 679 cases, C. J. White[8] concludes that alopecia accompanied by dandruff is the commonest type of loss of hair. Women are more prone to alopecia than men, in the proportion of 54 to 46. The causal factors of alopecia are heredity in 30 per cent., dandruff in 79 per cent., systemic depression in 20 per cent., fever in 11 per cent., and maltreatment of the scalp in 50 per cent. Alopecia simplex develops before the age of 30 in 84 per cent. of the men, but in only 33 per cent. of the women. Dandruff behaves in a similar manner, and before the age of 25 attacks 61 per cent. of its future male victims, 67 per cent. of the men, but only 34 per cent. of the women. Men are attacked earlier than women with alopecia and with seborrhea, but eventually women rather than men fall victims to these conditions. When dandruff is present it is apt to be abundant rather than slight, oily rather than dry, accompanied by itching, located in the great majority of the cases in the frontal and temporal regions and accompanied by hair which is apt to be dry, split, short and fine.

Seborrhea may exist for years without entailing any appreciable loss of hair; nevertheless, dandruff seems to be followed or accompanied by alopecia twice as often as not. Seborrhea simplex is a disease of childhood or early adult life, developing before the age of 30 in 71 per cent. of men and 96 per cent. of women. Other seborrheas of the skin such as acne vulgaris, acne rosacea, eczema seborrheicum and Fordyce's disease, may accompany loss of hair and dandruff. Their concomitance varies, consisting of 12 per cent. in alopecia furfuracea and 57 per cent. in seborrhea simplex.

Seborrhea simplex is a truer form of dandruff than

(7) Presse Méd., June 24, 1911.
(8) Jour. Amer. Med. Assoc., Sept. 10, 1910.

that accompanying loss of hair. In alopecia areata and in ringworm of the scalp, the region most affected is the occipital.

In alopecia areata dandruff is a frequent accompaniment, and we also find that one attack of the disease is apt to be followed by one or more later outbreaks.

General Melanosis. Boment and Francielon report a fatal case of general melanosis in a 65-year-old woman who February 19, 1909, came under their care for a small tumor of the left leg; early in 1909 a nevus had ulcerated after a fall. The wound did not heal but became covered with black fleshy masses. The patient at the same time had on the right frontal boss a small, uncolored, hard, painless tumor. Feb. 14, 1909, there was a fungous growth on the left leg which bled easily. It was hard, firm and attached by a pedicle. There were no enlarged glands. The patient had many nevi. The general health seemed good. The tumor was removed and histologic examination showed it to be a melanotic epithelioma. The patient left in seemingly good health but later a series of tumors appeared under the skin. January, 1911, she returned with generalized melanosis. She was then much emaciated and cyanotic. The seat of the excision was normal. There were numerous tumors scattered over the neck, face, back, trunk and extremities. There was much glandular enlargement. The tumors varied greatly in size from a walnut down. There were no metastases in the liver, which is quite unusual in such cases.

SPECIAL DERMATOSES.

Granuloma Annulosa is reported by C. J. White[9] in an 8-year-old girl. The father had tuberculosis, the only case in the family. The little patient had had scarlet fever two years ago, and whooping cough last winter. Physical examination was negative except for a cutaneous eruption, which first appeared six weeks ago. To-day there is on the flexor surface of the left index finger, a painless oval ring 1¼ inches in diameter. The ring is elevated ¼ inch above the surface, is white, firm and elastic, and somewhat nodular. The center is probably at the level of the normal skin, and is free from abnormal signs except for a somewhat purplish color. Over the middle joint of the right index finger on the extensor surface is a circular line of papules, rather ill-defined, red in color, ⅜ inch in diameter, the arrangement producing a ring-shaped eruption resembling its fellow in the left finger.

The rings continued to extend peripherally, the larger one gaining ¼ inch in diameter, and some of the individual papules became delled and glistened. This advance continued for about six weeks and then *x*-ray exposures were instituted, and at the end of a week distinct softening of the lesions had begun, although the periphery had continued to extend. Three weeks after the use of the *x*-rays the lesions were level with the normal skin, but the extent of the previous process could be seen clearly by the color differences of the healthy and the abnormal skin.

The stratum germinativum was normal, but the overlying rete cells changed abruptly. The protoplasm of the cell shrunk, leaving the nucleus occupying the larger portion of the cell structure; or the protoplasm around the nucleus disappeared, leaving conspicuous

(9) Boston Med. and Surg. Jour., May 4, 1911.

perinuclear halos; or again, the nuclear protoplasm rarefied, leaving a clear space containing chromatin granules floating within the nuclear rim. The stratum granulosum was hyperplastic and dense. The cell boundaries were very indistinct and the layer as a whole seemed compressed. Above this layer was an indeterminate zone, basic in its affinity and difficult to name. It was very compact and contained many elongated flattened nuclei without granules. This zone occupied the area of the stratum lucidum, but could hardly be designated by this name. Above this debatable ground appeared a very hyperplastic stratum corneum which was almost twice as thick as the whole underlying epidermis. It was wholly atypical and consisted of swollen horny cells full of vesicular spaces, most of which seemed to hold a degenerated nucleus containing granular matter. The subpapillary layer was rather rarefied and held numerous vessels, many of which were slightly dilated and surrounded by lymphocytes. On the other hand, some of these vessels showed endothelial thickening. Below this level the corium became highly pathologic and contained many lobules contiguous to one another and separated by more or less vertical or slanting bands of fibrous tissue. The lobules themselves were composed of short, dense connective tissue cells containing many lymphocytes. Within these lobules were large veins exhibiting considerable endothelial thickening, and here and there total obliteration. Sweat glands, when present, seemed compressed, and their lumen was much restricted in diameter. These structures seemed to be analogous to the cellular invasions of the fat cells observed in erythema induratum, and in places in these sections this invasion and final obliteration of the panniculus adiposus could be well observed. No giant-cells, however, were noted. The elastic element in the corium was very much reduced in amount everywhere. It was deficient in amount in the papillary and subpapillary zones, while in the neoplastic lobules elastin was represented solely by a few somewhat large and peculiarly straight rods.

White also describes a case of granuloma fungoides in a 46-year-old woman which began as pruritic eczema

seven years previously and was treated as an eczema by various physicians until a dermatologist diagnosed developing granuloma fungoides. The chronic red infiltrations of the right popliteal and right mammary regions became more infiltrated and raised above the skin. On entrance to the hospital there were numerous, typical, dusky-red, superficially rough and scaly infiltrations scattered over the body. The left foot and left labium were swollen and glands were palpable in the left inguinal and right mammary and axillary regions. Bandaging gave some relief to the edema. A few days later the abdomen began to swell and this condition increased rapidly from day to day. Bullæ developed on the left leg and thigh, which reached large dimensions and became brawny. Flatulency developed and ingestion of food was disagreeable because of the growing abdominal tumor. The left lower extremity and inguinal region threatened to break down. Throughout these twenty-three days vigorous *x*-ray treatment was carried out to the extreme limit. The individual lesions responded well to the influence of the rays. On the twenty-fourth day laparotomy revealed a large cyst of the left broad ligament containing brownish, turbid fluid. Recovery from ether was good, but lack of appetite and of sleep retarded convalescence. Restlessness and abdominal pain supervened and the following day the patient suddenly died.

The necropsy revealed a mass in the left inguinal region which showed the operation wound 5 cm. long. This was opened and exposed broken-down, dirty, grayish, new growth-like tissue. The section of the axillary masses showed tissue similar to that in the groins. The peritoneal cavity contained a slight excess of reddish cloudy fluid. The serosa of contiguous coils of the small intestine were coated with a slight amount of reddish, granular fibrinous material. The pelvic cavity contained a large mass of tissue which extended over the brim posteriorly, infiltrating all through the tissues. On section this tissue was grayish-white, encephaloid in character and continuous with the masses in the inguinal region. This mass infiltrated also the psoas and the

muscles of the anterior abdominal wall. In the region of the mesenteric and retroperitoneal glands there were smaller and larger masses resembling the tissue already described.

The skin sections examined were ulcerated to a large extent. The epidermis of the unbroken skin was greatly flattened by the tremendous underlying cellular invasion and the interpapillary downgrowths were sparse, slim or absent. The rete was reduced to a few layers of sickly cells, the granular stratum was for the most part absent and the horny layer was unimportant. The corium was almost entirely occupied by dense, though somewhat scattered, homogeneous masses of mononuclear cells, whose nuclei were unusually large and whose extranuclear protoplasm was almost invisible. The supporting reticular membrane was difficult to discern owing to the density of the infiltrating cells. Curiously enough there were a few scattered fibers of elastin, delicate and long and straight in the thickest cellular masses, short and thick in the sparser areas. In the ulcerated portions of the sections the lymphocytic masses extended quite to the free border of the skin. The new-growth-like mass from the peritoneal cavity was similar in all respects to that of the corium of the skin—a dense, almost solid mass of lymphocytes supported by an almost visible fibrous reticulum.

Keratosis Follicularis is reported by A. P. Perry [1] in a 17-year-old brunette who had never had anything but exanthemata during childhood. The family history was good. For some years past brownish areas appeared in various places on her body and limbs; in the bend of the right elbow, on the anterior surface of the left leg two inches below the patella, on the abdomen in the median line below the umbilicus, and recently one began to show on the neck just below the edge of the collar. These areas were of varying size, up to one or two inches in diameter, of irregular outline, and presented the appearance of patches of dirt on the surface of the skin, being yellowish-brown or a darker shade of the same color. On examination, these were found to be

(1) Amer. Jour. Derm., January, 1911.

appreciably elevated above the surrounding skin. There was no discharge or odor; there were no subjective symptoms. The patches grew very slowly.

At first there was apparently only a deeper pigmentation of the skin, but some weeks or months later the patches assumed a rough nutmeg-grater appearance and felt rough and hard to the touch. Microscopic examination of sections through one of the small lesions showed moderate elongation of the papillæ of the corium, marked thickening of the horny layer, which was piled up in loose flakes on the surface; slight thickening of the prickle-cell layer in places, and apparently a slight pigmentation of the lower layers of the epidermis. There was no inflammatory infiltration of the corium, no obstruction of mouths of sebaceous glands, and no dilatation of blood or lymph vessels.

Treatment with various local remedies was without permanent effect. Ungentum acidi salicylici, emplastrum acidi salicylici, ungentum resorcini, dilute potassium hydrate, sapo viridis and even curettage were employed in turn, but served only to improve the appearance of the patches temporarily. Excision was impracticable on account of probability of recurrence of the disease beyond the borders of the incision, and the scar disfigurement. Liquor potassii arsenitis was used internally for a long period. *X*-ray treatment had good results up to the time the patient removed to another city.

Dermatitis Exfoliativa is reported by C. J. White [2] in a 24-year-old male who had a penis sore which became phagedenic, but healed in about six weeks. One week later a faint roseola appeared and the man began to take internally some capsules and to rub in externally "mercurettes." This was done for more than six weeks. In June there was a week of malaise, sore throat, etc. In late July he noticed vesicles on the lateral aspects of the fingers, and one week later "water blisters" between the scapulæ and on the face.

On Aug. 26 the patient entered the hospital in a state of universal desquamation. The scales were large, thick,

(2) Boston Med. and Surg. Jour., May 4, 1911.

loose at the periphery and attached at the center. There was considerable moisture about the face and there were remains of bullæ about the ankles. Itching was a marked feature and the skin as a whole had a dusky red hue. The general physical condition was good, insomnia and pruritis being the only marked pathologic features. Twelve days later the mental condition became clouded and the man was restless and irritable, but in another week the skin began to be less moist and to desquamate less and the patient became more normal mentally. In October the skin was nearly normal in color and quite dry, and the desquamated scales were much smaller in size than at any previous time. A few days later, however, the sacral skin became moist and erythematous, then the same conditions developed on the legs and finally the whole body surface became moist, dusky red and rather denuded of scales. Improvement again followed but the patient became tired and left the hospital on Nov. 1.

A few days later, after no care, because the nurses of a private hospital were afraid to go near him, he was found in a most deplorable condition. The odor from his body was most insupportable, the whole surface was moist, dusky red, covered with large thick scales attached at their center, and his bed was literally full of desquamated scales. The man was ordered home, where he has been seen every two weeks. February, 1911, he had gained considerable weight and the skin was practically normal with the exception of that of his face and lower legs. The hair had grown again everywhere except in the anterior portion of the scalp. The nails were still replaced by elevated conical keratinous masses. This great change for the better was due to more favorable surroundings, but chiefly to suppression of external treatment save borated talcum powder.

Dermatoses from Belladonna belong, as was pointed out in the *Practical Medicine Series* six years ago, to the erythema group as a rule. F. C. Knowles [3] points out that more or less generalized eruptions not only occur from the internal administration of belladonna and its

(3) Amer. Jour. Med. Sciences, July, 1911.

alkaloid atropin, but also from absorption through the skin of local applications of the same. The skin does not have to be broken or denuded of epidermis for absorption to take place; the symptoms of poisoning, however, develop much sooner if the skin is broken. The great majority of the cases exhibit an erythematous or scarlatinal type of eruption, which is more frequently found on the face and the upper portion of the body, but in a fair number of cases the outbreak is generalized. Gangrenous, purpuric, and eczematous eruptions have been reported. The author describes a unique, or at least a very unusual, type of outbreak. Although in a great many instances severe symptoms of poisoning are present, the eruption may be unaccompanied by other manifestations of drug absorption. Mydriasis is a quite constant phenomenon; in a few cases, however, the pupils are only slightly enlarged, entirely normal, or unilaterally dilated. The prognosis is favorable; only one death occurred in this large series of cases. Belladonna or atropin may produce a local eruption from the local irritant effect.

Cheilitis Glandularis Apostematosa, first described by Volkmann[4] forty years ago, is comparatively rare. So far 13 cases have been reported, 5 by Volkmann, 4 by Gordon, 1 by Howard Fox,[5] and 3 by R. L. Sutton,[6] who now reports cases in which histologic examinations were made. The disease is characterized by a thickened and edematous condition of one or both lips, more often of the lower only, with hypertrophy of the mucous glands and enlargement of the follicular orifices. When the lip is everted it is possible to see these widely dilated openings, and when pressure is applied over the glands a glistening secretion exudes, which resembles drops of dew on the previously dried surface of the lip. In three cases, abscesses have developed. There is generally an associated catarrhal inflammation of the buccal mucosa. The disorder usually appears early in life, and is very chronic. In Sutton's last cases there was enormous dilatation of the ducts of the mucous glands, with thickening of the walls. The hypertrophic changes were to be

(4) Virchows's Archiv, 1870.
(5) Jour. Cut. Diseases, 1909.
(6) Jour. Mo. State Med. Assoc., May, 1911.

seen in the acini as well as in the ducts, and in some of the appendages the glandular substance was greatly increased in amount. The cells of the acini were chiefly of the mucous variety in an active state of secretion, but considerable numbers of serous cells also were observed. The neighboring papillæ also were increased in size.

The alterations in the corium were surprisingly slight. There were some degenerative changes in the connective tissue, but not so marked as to be particularly noticeable. The elastic fibers were increased both in size and number (tissue from a normal lip was studied for comparison), but the arrangement was unchanged. There was considerable thickening of the interacinal connective tissue. It is very probable that this hypertrophy, together with the enlargement of the ducts, is what gives the impression of shot-bag-like resistance to the finger when a case is examined clinically.

Three of Volkmann's patients recovered under potassium iodid internally, but none of the other cases were cured by any drug. The condition is somewhat benefited by a long series of *x*-rays, and Sutton found the most satisfactory treatment to be excision by Keyes' cutaneous punch.

Cheilitis Exfoliativa, first described by Stelwagon, is characterized by a chronic inflammatory process which involves the border of one or both lips, with the formation of slight, dry, adherent scales and crusts. There is very little if any thickening, and the bright redness, itching, and liquid exudation distinctive of an eczema are wanting. Exacerbation and improvement may be noted from time to time at irregular intervals. Neighboring areas on the skin sometimes are attacked, and in a few instances the dorsum of the tip of the tongue, and the buccal mucous membrane adjoining the lip have been involved.

The condition has been variously ascribed to seborrheic dermatitis, lupus erythematosus, and chronic eczema. Differential diagnosis is to lie between these three. Syphilis is easily ruled out. The affection bears no resemblance to the dermatosis first ascribed by For-

dyce, called pseudocolloid of the lips by Crocker. The acute character and the very decided inflammatory manifestations seen in Baelz's disease eliminate it as a possible factor.

Recently R. L. Sutton [7] had two cases of cheilitis in which there was apparently a combination of the diseases described by Volkmann and by Stelwagon. Some scaling was observed in three of Volkmann's patients. Sutton's observations in 5 typical cases led him to believe that this manifestation is not characteristic of cheilitis glandularis. When the associated changes are such as to simulate closely the clinical features of cheilitis exfoliativa the evidence warrants the conclusion that both are present.

Cheilitis glandularis apostematosa and cheilitis exfoliativa have no relationship. The first is characterized by an enormous hypertrophy of the ducts, and usually of the glandular substance also, of the mucous glands of the lip, and is probably congenital in origin, being simply one of the manifestations of an excessive supply of glandular tissue to the nose, pharynx, mouth, and lips.

The second is a chronic, localized seborrheic dermatitis. The associated involvement of the tongue and buccal mucous membrane in some instances cannot be explained in the light of present knowledge.

Finger Nail Fungus Infection is discussed by R. C. Low [8] who divides it into: Ringworm of the nails, favus of the nails, and unknown infection. The majority of the nail ringworm cases occur in females, only 2 of 16 cases being in males. According to Torok, ringworm of the nails is most frequent in manicured nails, but Low's cases were not found among the manicuring class. Frequent washing of infected material, *e. g.* clothes, etc., may be the reason why females so frequently suffer. Ringworm of the nails may occur at any period of life. The youngest of Low's cases was 11 years of age, and the oldest, 58. The majority were girls of between 20 and 30 years. This age-incidence corresponds more nearly to that of tinea corporis than that of tinea capitis. Ringworm of the nails is very rare in children with ring-

(8) Edinburgh Med. Jour., Vol. VI, No. 2.

worm of the scalp. Sabouraud, in l'Ecole Lailler, where there were always about 300 children with ringworm of the scalp, in four years saw only 2 cases where the nails were affected. This infrequency of nail infection in children with ringworm may be partly due to the fact that ringworm of the nails is always due to the large-spore fungus, but even amongst children suffering from large-spore tinea of the scalp nail affections are very rare. Low thinks the most probable explanation is that because tinea capitis so rarely causes any itching there is no tendency to scratch and so to infect the nails. The inflamed ringworms (kerion) are also too tender to allow of scratching.

The source of infection is often difficult to trace. In only 1 of the 16 cases did the patient suggest that the disease was due to an infection from anyone else. The patient blamed the washing of clothes worn by her husband and son, who had what was apparently tinea barbæ. In all the other cases the patient had no idea of the condition being a contagious one. In another case there is little doubt that the disease was contracted from her brother who had tinea barbæ at the time her nails became infected, but cultures were not made from the brother's head. Low cannot say whether or not both conditions were due to the same fungus.

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Two of the cases were husband and wife and two others were sisters, and in these cases there was probably either a common source of infection or infection the one from the other. One woman was undoubtedly infected from her children, who had tinea capitis of the large-spore kind. In washing and rubbing their heads she contracted ringworm of the hands and fingers, the disease later spreading to the nails. In this case cultures showed that the same fungus was present in the nails as on the children's heads. This method has been described by Vidal, who noticed that nurses who epilated ringworm cases at the *Hôpital St. Louis* were frequently infected with ringworm of the nails.

In all other cases no source of infection could be traced either from previous lesions on their own skins, from infection from relatives or friends or from animals.

In two cases there was a history of injury of the nail shortly before the disease began. Infection may have taken place at that time. One case was associated with spoon-nails. The spoon-nail was well marked in all the nails and possibly such nails are more liable to fungus infections than normal ones.

The duration of the disease varied from three weeks up to seven years, the average time being about four years. Only a very few of the cases had been previously treated, and in some the disease was discovered accidentally, when the patient came complaining of some other condition.

The number of nails affected in each case varied from one to seven. No one nail was more often affected than another. In one-half of the cases both hands were affected, in the other half only one hand. In the 8 cases of the latter group, 4 showed the disease on the right hand and 4 on the left. In none of the cases were the toe-nails affected. (See Plates I and II.)

Diagnosis in all cases was comparatively easily made, the appearance of the nails being very constant. In all previously recorded cases the authors lay stress on the splitting up and splintering off of the free margin of the nail. This is characteristic of the disease, but as the patient often clips away any loose parts, the nail frequently does not show this to any great degree.

The color of the nails has been variously described as varying from a yellowish-white to a brown or black color. In nearly all cases Low found that there are definite zones presenting different colors and appearances, these zones being very constant in arrangement. The infection seems to take place from the under surface of the free margin of the nail. At the tip the nail becomes undermined, dark in color, and softer than normal, so that if a blunt instrument in inserted under it some of the softened nail substance can be easily removed. The disease slowly spreads up the nail, and as it spreads the nail becomes more broken up, till finally, when the whole of it is infected, the free margin breaks off in splinters of a dirty white color. These broken parts at the tip are easily removed. Then comes a zone where the nail is

light yellow in color, longitudinally striped with darker lines. At this level pieces of the nail can be scraped off only with difficulty. Further up still there is a peculiar dark yellowish-red zone, fairly smooth on the surface, and showing very little tendency to split up. These three zones were distinctly seen in most of the affected nails, and appeared to Low to be very characteristic of the condition, more especially the yellow-red zone at the upper part. This yellow-red smooth area represents the spreading edge, where the infection is only just beginning. In the light yellow area further down, the nail is permeated with the fungus, but not yet sufficiently so as to cause the nail to break up. The tip is the part of the nail which has been longest infected, is thoroughly permeated by the fungus, and so is split up and cast off. These zones look as if they were stationary, whereas in reality the upward growth of the fungus is simply keeping pace with the downward growth of the nail.

In addition to these color changes and splitting up, there is also in many cases a heaping up of the nail into irregularly arranged prominences with dark blackish-brown depressions between. When the nail remains flat the nail substance is probably the only part affected with the fungus, but when it becomes raised up and distorted the nail-bed is probably also affected. In many cases the lunule has disappeared altogether, and the tissues at the base of the nail are red and somewhat swollen. In such cases the nail is very distorted, and it is an indication probably that the growing nail-matrix is invaded by the fungus. Apart from the disfigurement there are no symptoms associated with the disease.

Pieces of the nail were scraped off with a sharp spoon or clipped off with scissors, put in liquor potassæ (6 per cent.), and gently heated for a few minutes. They all showed the same apearances. Inside the nail-substance branching mycelium and spores were to be seen. The spores were square in shape and arranged very characteristically in rows. If the fungus is not visible at once pieces of the nail should be left in the caustic potash solution over night, and if it is present at all there is no

difficulty in seeing it the next morning. In some of the cases fungus was not found in the first pieces of nail examined. Therefore in all cases of suspected fungus disease of the nails scrapings should be repeatedly examined. In every case where a patient presents a splitting up of the nails which does not affect all of them, a thorough examination should be made for the fungus. Finding of the typical fungus is positive proof of ringworm. Failure to do so on the first examination does not necessarily exclude that disease.

An attempt was made to stain the fungus in the nails by gentian violet and other stains, but the results were not satisfactory. The caustic potash method is quite sufficient.

In order to determine the fungus, cultures were made from the nails of 8 of the patients. Pieces of nail were scraped or clipped off and placed for 2 or 3 minutes in absolute alcohol. Whilst in the alcohol they were broken up into as small pieces as possible. These were allowed to dry for a few minutes and then implanted on Sabouraud's proof-medium, which contains 4 per cent. maltose, 10 per cent. peptone, and 1.5 per cent. agar. The cultures were kept at a temperature of 20° C. Some showed pure culture of the fungus. The majority contained staphylococci, various yeasts, and *Penicillium glaucum*. By early subculture the fungus was easily isolated. In 5 of the cases *Trichophyton crateriforme flavum* (primrose-colored) was obtained. These cultures were those used by Colcott Fox in ringworm of the body and scalp. This culture begins as a white downy growth which very soon shows a central depression and the characteristics sulphur-yellow color. The central depression enlarges till a typical crater is formed. In some there are radiating depressions running outwards from the crater in the center, in others these are not marked. The surface of the culture looks powdery, and in old cultures the central crater-like area becomes brownish in color and cracked. If these cultures be kept for some time a change takes place. There appears a whitish growth, which gradually spreads over the yellow culture and obscures it. This is the pleomorphic change

which occurs in all old ringworm cultures which are grown on media containing sugar, such as maltose. Subcultures from this altered culture gives very beautiful whitish-yellow growths which are distinctly crateriform.

The cultures from the other two cases correspond to the *Trichophyton rosaceum*, which is the large-spored fungus found on birds. The young cultures are fluffy and white, but soon show a delicate pink color, and in some of the growths a yellowish tinge in the center. They are raised in the center and have a few radiating depressions. These cultures also rapidly tend to show a pure white pleomorphic growth. (See Plates III.)

From another case peculiar cultures were obtained. At first they were contaminated by *Staphylococcus citreus*. They were repeatedly subcultured and a growth obtained which had a pink tinge in places. On making subcultures from the white and pink parts two distinct cultures were obtained. Unfortunately the growth of these cultures was not watched very closely, and Low cannot say definitely whether the culture was originally white all over or whether there was a mixture of pink and white from the first. The white culture corresponds somewhat to the *Trichophyton acuminatum* in its appearances, but is smoother on its surface. Low is not prepared to say whether it is the *Trichophyton acuminatum* or a pleomorphic form of the pink culture. Sabouraud found *Trichophyton acuminatum* and *Trichophyton violaceum;* Favera obtained *Trichophyton violaceum* and *Trichophyton rosaceum.* To these must now be added the *Trichophyton crateriforme flavum* found in Low's case. (See Plates III, IV, V and VI.)

Treatment in these cases was difficult. Many of them were seen only once. All methods of treatment have for their object the softening and mechanical removal of as much of the diseased nail as possible and the application of some continuous antiseptic dressing. The easiest method is to keep the nail covered with an india-rubber finger-stall after applying ung. hydrarg. ammoniat. night and morning. Of course, the softened nail must be scraped away every day. One of the cases was cured by

this method in three months, but in the majority of cases this method is quite ineffectual. A better method is Harrison's, *i. e.*, in addition to the regular daily scraping a solution of pot. iodid, 3j in liq. potassæ, and aq. destill., āā 3ss, is applied for half an hour on a piece of cotton wool. It is then removed, and for the rest of the 24 hours a solution of hydrarg. perchlor., grs. iv in spir. vini, and aq. destill., āā 3ss, is applied on lint, and the finger covered with an india-rubber finger-stall. These applications are repeated daily till the nail becomes black and so soft that it can be removed. In one case cure was effected in 2 months. The failure in the other cases was due to the patients who stopped the applications as soon as the nails became the least painful. To get good results the patient must be seen frequently, and the nails scraped by the dermatologist himself.

Norman Walker applies Fehling's test-solution on lint to the nail, covers it with a finger-stall, and leaves it on for a day or two. At the end of that time the whole nail is so soft and pulpy that it can easily be removed by forceps. After the nail is covered a solution of copper sulphate, grs. x, in water 3j, is used as a continuous dressing. This method gave good results in some cases. Whatever method be used, long and painstaking treatment is essential for success. When the disease is cured the nail grows in without any deformity.

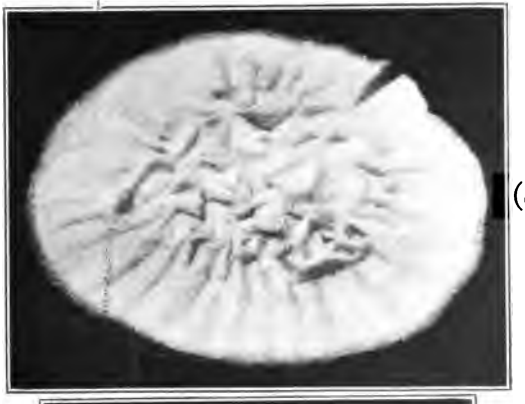
Low has seen 2 cases of favus of the nails. Both were in children with scalp favus. The appearance of the nails is very similar to that of tinea, but the nails are yellower in color. A mass of fungus also tends to accumulate like a scutulum underneath the nails and raise it up. The diagnosis is made by finding the fungus microscopically, and the treatment is the same as that in ringworm.

The other fungus infection occurred in a girl aged 22. Three nails had been diseased for ten years. They were greenish-yellow and were splintering off. There was also heaping up of the nails at places. Scrapings from them showed that a fungus was present which differed from the fungus in the ringworm and favus cases. The mycelium was very fine, and in long slightly

branched threads. The spores were arranged in bunches, and were round or pear-shaped. Cultures gave a fluffy greyish-white growth. This culture was certainly not ringworm or favus. The nails were removed in this case after being softened by caustic potash, but some weeks later the new growing nail was still found to be infected with the fungus.

PLATE I.
Ringworm of the finger-nails.

PLATE II.
Ringworm of the finger-nails.



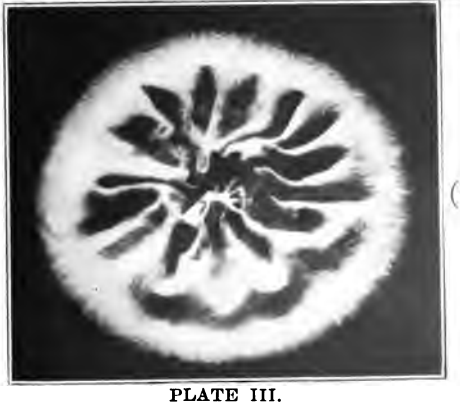


PLATE III.

Cultures (about six weeks old on Sabourand's medium) of fungi from finger-nails.

(a) Trichophyton acuminatum.
(b) Trichophyton rosaceum.
(c) Trichophyton crateriforme flavum.

(a)

(b)

PLATE IV.

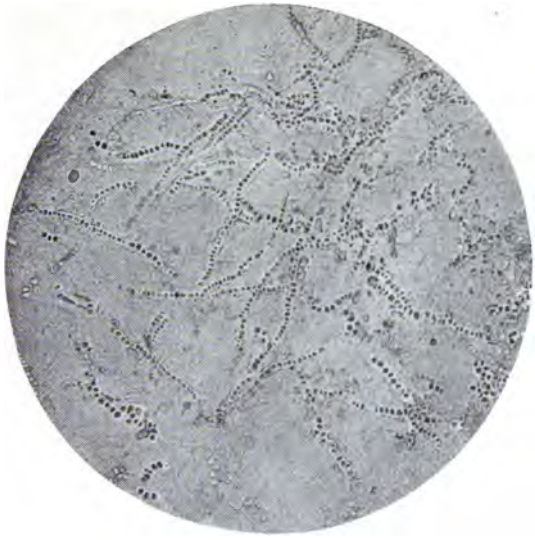
(a) Trichophyton crateriforme flavum.
(b) Pleomorphic form of trichophyton crateriforme flavum.

(a)

(b)

PLATE V.

(a) Fungus (unknown variety) in finger-nail.
(b) Fungus from finger-nail (variety unknown) grown for six weeks on Sabourand's medium.



(a)

(b)

PLATE VI.

(a) Ringworm fungus in finger-nail. Mounted in liquor potassæ. (X 400.)

(b) Same as above. (Oil immersion.)

THERAPY OF THE DERMATOSES.

Therapeutics in the domain of dermatology has not during the current year been sensationally exploited. In both local and constitutional treatment broad lines have been followed out and the control rules of science rather rigidly adhered to. The extended use of carbonic acid snow has naturally revealed untoward effects really due to acquired or inherited instabilities of constitution, but which as usual are charged to the drug or its mode of preparation. Substitutes are being suggested which, however, do not meet the difficulties.

Antimony in Trypanosomiasis. According to C. N. B. Camac antimony is of much value in trypanosomiasis. He injected antimony sodiotartrate, one-sixth of a grain in normal saline solution, into a vein of the arm thirteen consecutive times between Nov. 10, 1909, and Feb. 1, 1910. The manifestations were severe, alarming and entirely without warning. The great excess of indican, had it been noted before the last injection, might have been a warning. The urine had been watched carefully for signs of disturbed renal function, but with negative results. The behavior of the disease subsequent to the antimony poisoning was most important. From June, 1907, to November, 1909 (prior to the intravenous administration of the antimony), there were twenty-six febrile paroxysms associated invariably with trypanosomes in the peripheral blood. From that date the active antimony treatment was begun, and except for the two rises of temperature occurring with the other symptoms of poisoning, no fevers occurred, and trypanosomes were not found in the peripheral blood or in animals inoculated with blood and spinal fluid. That is, parasites, and fever have been absent for one and one-half years.

Arylarsonates in Pellagra are discussed by E. H. Martin,[8] who had under his care 8 cases of pronounced

(8) N. Y. Med. Jour., Feb. 4, 1911.

pellagra and 5 of suspected pellagra. In the 5 suspected cases the patients were promptly relieved of their suspicious symptoms by a few injections of soamin (atoxyl). In the 8 pronounced cases, the patients were too nearly dead when he first saw them to have any chance; in fact, treatment was instituted in only one of these cases, and the patient died within a week of her arrival at Hot Springs. In 5 other pronounced cases the patients made apparent recoveries within a few weeks. Only one case had been under observation for more than a year, giving time for the only relapse. In this case the relapse was not waited for, but injections of small doses of soamin were given during the past summer. The patient was then enjoying good health and intended to stop treatment for the winter. The 4 patients apparently cured during the past summer were given soamin in small doses at longer intervals after returning to their homes, and are now in seemingly good health.

Arsenic, according to J. A. Gunn and W. J. Feltham,[9] whether in the form of sodium arsenite or sodium arsenate exerts on the red blood-corpuscles an action antagonistic to that of certain hemolytic agents. The experiments, therefore, afford additional proof in favor of the view that a protective action on the formed red blood-corpuscles against normal or abnormal hemolytic processes may, in part at least, account for the as yet imperfectly explained benefit which results from the medicinal administration of arsenic in blood diseases.

Iodin in Dermatology. After some decades of neglect iodin is now widely boomed as an antiseptic. Used by A. C. Post and other American practitioners of aseptic methods before Listerism, it fell into neglect through the theoretic advantages of phenol. H. H. Stromberger [1] makes a plea for its use in dermatology. In traumatisms of the skin and penetrating wounds of all kinds, swabbing with straw-colored tincture of iodin is the best prophylactic against infection. Leg ulcers, tuberculous abscesses, burns, lepra, psoriasis, acne, lupus, old chronic sores and ulcers with foul sloughing

(9) Brit. Med. Jour., Jan. 21, 1911.
(1) Amer. Jour. Derm., May, 1911.

cavities and bases, chancroids, phagedenæ, buboes, fistulas, chronic urticaria, respond promptly to iodin in its various combinations and applications.

Scarlet Red in Ulcers. Scarlet red is made from diazobenzoldisulphonic acid and betanaphthol. It is a powerful stimulant to epithelial tissue growth. It is used as an ointment in 8 per cent. strength in vaseline, and can be used in combination with boric acid, zinc oxid and balsam of peru ointments in the same proportion. The latter method is the better way of using it, for in this combination we obtain both an antiseptic and stimulating action. Given an ulcer of the leg with clean healthy granulations, it should be bathed in boric acid solution and dried before applying the ointment. Should the granulations be unhealthy hydrogen peroxid is used before the boric acid solution. It is best not to use bichlorid of mercury or other strong antiseptic solutions of the wound before treating it with scarlet red. Free use of the silver nitrate stick is advisable to keep down exuberant granulations. The skin surrounding the defect should be anointed with some bland ointment up to within 1 cm. of the edge. Since this practice has been followed the irritation complained of in some of the early cases has been to a large extent eliminated.

The ointment may be applied over the whole surface of the wound if it be small, or simply to the growing epithelial edge. Whichever method is chosen it is best to apply the ointment on linen to which the granulations will not adhere, or which allows the escape of secretions and thus prevents maceration when applied to the edges. The old linen should be used in narrow strips covered with a thin layer of ointment. The old linen is preferable to the rubber protective, as it is less macerating.

Another very satisfactory method is to apply a thin coating of the scarlet-red ointment to the wound edges with a camel's hair brush, being sure that the edges are dry. Then either cover with strips of linen or expose to the air. This is especially useful in the partial graft cases, and on small wounds, as the ointment can thus

(2) Amer. Jour. Derm., May, 1911.

be accurately placed and the amount regulated. The portions of the wound not covered by scarlet red may be dressed as seems best, or may simply be exposed to the air under a cage. A light dressing of sterile gauze secured by a bandage completes the procedure. This dressing should be removed within forty-eight hours, twenty-four hour intervals being preferable, and replaced by some bland ointment, such as zinc or boric ointment. After the same interval has elapsed the scarlet-red dressing should be replaced. The importance of careful dressing is to be emphasized, as in some cases severe irritation has followed the improper application of the dressing. It is well to warn patients that the ointment may stain the dressing red, as they may return much afraid that the wound has been bleeding.

Paste for Varicose Ulcers. Wehner [3] advises the following paste in ulcus cruris varicosum:

℞ Zinc oxid
Starch ..... āā 30.0 grams.
Glycerin
Water
Wool fat
Simple cerate ..... āā ad 100.0 grams.
M.

Dermatotherapic Paste. Dreuw [4] advises the following:

℞ Zinc oxid 3ijss
Precipitated silica ..... gr.xxx
Benzoinated lard 3vij
M. Ft. unguent.

This paste has a greater attraction for capillary moisture than the well known Lassar's paste of the following composition:

℞ Zinc oxid
Starch
Petrolatum
Wool fat āā partes equales.
M. Ft. unguent.

The use of the paste which Dreuw calls cement paste, is recommended in the treatment of eczema madidans and other dermatoses characterized by supersecretion of moisture, the precipitated silica being credited with

(3) Deutsche med. Wochenschr., May 11, 1911.
(4) Monatsschr. f. Prakt. Derm., December, 1910; also N. Y. Med. Jour., Mar. 18, 1911.

excellent absorbent and drying properties. Various medicinal agents may be incorporated with the basic paste, as ichthyol, sulphur, tar, pyrogallol, etc.

Trichloracetic Acid in Superficial Cauterization is advised by C. Knauer[5] as a substitute for carbonic acid snow. Care should be exercised that none of the acid touches the healthy skin. It is, therefore, always best to paint a zone of collodion around the affected area. The acid is first liquefied with one or more drops of water, then applied with a glass rod. The cauterization is always very superficial unless the acid is actually rubbed into the tissues. A second application is rarely necessary, and should be postponed until the scab has fallen off. The cauterized tissue will appear white as snow and the surrounding area will show only a moderate hyperemia. Vesicles never form and the cauterized area will turn brown after several hours. After eight or ten days the scab can generally be loosened. The cosmetic results are excellent. There is hardly any pain during application.

Hyperemia in Dermatology. W. K. Sibley,[6] discussing Bier's method, says that practically all chronic forms of skin diseases are benefited by the hyperemic treatment before applying local remedies. The action of ointments and lotions is considerably facilitated if a local congestion of the part is produced before they are applied. This local hyperemia probably acts in two ways. In the first place, by producing a passive congestion, it increases the blood-supply, and so improves the nutrition of the part, and at the same time encourages the removal of deleterious products by the venous blood. In the second place, this local hyperemia assists in the local action of the drugs when they are afterwards applied.

Of the cases so far treated the most satisfactory results have been obtained in psoriasis, especially in some very old-standing cases in which the lesions were very chronic and localized. Cases of years' standing where very persistent lesions are limited to a small area, such as the knees or elbows, and which resist all treatment,

(5) Münch. med. Wochenschr., Apr. 18, 1911.
(6) Lancet, Feb. 4, 1911.

are specially benefited by this method. Some cases of lupus vulgaris have shown rapid improvement—in fact, from some recent observations the hyperemic method showed earlier and much more satisfactory results than the *x*-rays had done. Acne, both diffuse and local, reacted well, but these cases required a considerably greater amount of congestion and more frequently repeated treatments, both general, over a broadly affected area, and afterwards local, over the individual and more persistent comedones and pustules.

The immediate result of the local treatment is to produce a venous congestion of the skin, which increases the action of the sudoriferous glands, and gives rise to a varying degree of perspiration. This varies with the nature of the lesion and the degree of hyperemia produced. In some conditions only an almost imperceptible amount of sweating results, perhaps just sufficient to produce a slight haziness on the sides of the cupping glass without a visible sweat on the skin. In others, such as many eczemas and seborrheas, a profuse perspiration is quickly produced, and after a few minutes the whole part is bathed in sweat. In other cases the ordinary sweat is replaced by a serous exudation. In some instances of non-ulcerated lupus, which as a class perspire very freely under the treatment, a blood-stained serum exuded after a short time and for this reason the cases require to be very carefully treated and only for very short periods at a time, one minute or so being usually sufficient.

Research into the different reactions of various skin lesions under hyperemia will be of value in defining similarities or differences between some of the less easily distinguished dermatoses. These physiologic or pathologic reactions of various lesions may not only become a help to the pathologist, but also be of considerable aid to diagnosis in some rather ill-defined, readily confused morbid states.

Rice Diet in Inflammatory Dermatoses. L. D. Bulkley[7] states that on August 20th he began to suffer with itching and tension in the right hand with deep papu-

(7) Med. Record, Jan. 28, 1911.

lo-vesicles about the root of the little finger, necessitating the removal of a ring. This increased, day by day, affecting other fingers of the left hand. By the 24th he was exceedingly uncomfortable, and deep-seated vesicles had formed on the sides of the middle, third, and little fingers of both hands, also small, deep-seated vesicles on the backs of some of the fingers and on the back of the right hand. As he had had a similar trouble at about the same season of the year for a number of years past, he did not pay much attention to it, but used some simple remedies, including a calamine and zinc lotion, which had been of service in former attacks.

When the eruption first occurred, some years ago, he attributed it to poison ivy, which was abundant around his country home, but after a year or so this was excluded, as the eruption did not run the course of that trouble, and also he had sedulously avoided all contact with the vine. Nor did the disease seem to be eczema, for the whole course of the eruption had always been different from that affeciton, and even at its height or afterward, there had never been any tendency whatever to develop eczematous surfaces; when bullæ formed they were tense and hard, with very thick coverings which were ruptured only with great difficulty, and often became somewhat hemorrhagic. Nor did the eruption quite correspond to the course and appearance of dysidrosis or pompholyx.

As it seemed in other years to come on late in the summer, when he had eaten many peaches, he sometimes ascribed it to that cause, but this year he had eaten hardly a peach. He could attribute it only to some gouty and nervous condition, to which he was subject. Curiously enough, it affected mainly the ulnar side of both hands, or at least its greatest intensity was there. He placed himself on greatly restricted diet, consisting solely of rice, boiled in water, bread, butter, water, and absolutely nothing else. This diet he continued for five days, three times daily. He used no other medical treatment, external or internal, except that he continued a mild mixture of potassium acetate, nux vomica, and quassia, which he had been taking for

some time as a tonic, and which had had no effect on the eruption. The result of this sudden and radical change in the diet was remarkable; within twenty-four hours the tension, together with the burning and itching of the hands, was lessened, and there were no spasms of itching. In forty-eight hours there was further marked improvement, and he had very little discomfort, even on washing and wiping the hands. By the end of four days the blebs were flaccid and the swelling of the hands quite gone; there had been no new production of lesions after instituting the diet, and the disease seemed entirely checked. He continued the absolute diet, however, for one day more, in order to complete the five days of diet which he had commonly found requisite for patients. One week later most of the surfaces badly affected had exfoliated, leaving smooth, almost normal skin.

Treatment of Furunculosis. According to H. K. Gaskill,[8] the average case of furunculosis under proper antiseptic precautions against further crops, will cure itself in from one to four months, but many factors enter into the causation of the disease, and one should inquire carefully into the patient's habits, occupation and mode of living; of first importance must be considered an existing diabetes, nephritis or transitory albuminuria. Disorders of the gastro-intestinal tract play an important part in the etiology, as does excessive sweating, friction, lack of, or even excessive use of soap and water. Men who work in paraffin or bar-metal workers and those who are thrown in close contact with potassium permanganate, potassium iodid and the bromids are frequently affected.

When single, the lesions are usually due to some local injury as blows, friction or from pressure exerted, shown by those who have a sedentary occupation, as tailors, who often have a succession of single or multiple boils on the buttocks. Boils frequently follow various eruptive fevers, especially variola, septicemia, pyemia, sewer gas poisoning and may occur as complications of certain skin diseases, such as scabies, eczema, etc.

(8) Amer. Jour. Derm., July, 1911.

PLATE VII.

Pemphigus occurring in a mail-carrier, 40 years old, with a history of recurrent bullous eruption on the upper and lower extremities for about a year and a half, referred for treatment as a case of leprosy. The family and previous history were negative except for frequent traumata of the fingers of both hands, the toes of both feet, and Pott's fracture of the right leg.

PLATE VIII.

Forearms and hands of the patient shown in Plate VII. In this case bacteriologic examination of the contents of the bullæ was negative. Bacteriologic examination of the secretion from the surface of the ulceration showed no lepra bacillus. The Wassermann test was negative. Examination of the blood was negative. The patient under iodids administered in the form of a mild mixed treatment showed marked improvement.

PLATE IX.

Two members of a family of two adults and six children all of whom are suffering from impetigo contagiosa. The disease started on the father who was infected by shaving with a razor used previously by his brother who was supposed to have "barber's itch." Within two weeks the other seven members of his family had the disease.

PLATE X.

Neurofibromatosis (Von Recklinghausen's Disease) Dr. Oliver Ormsby's case shown at the October, 1911, meeting of the *Chicago Dermatological Society*. The subject of this disorder is 39 years of age. The family history is entirely negative. The patient is married and has one healthy child. He states that the largest tumor has been present for about thirty years. The major portion of the lesions are of twenty years' duration. He states that they began as small spots, which gradually grew. He believes that it takes about ten years for them to become the size of a small hickory nut.

PLATE XI.

The back of the patient shown in Plate X. The lesions consist of tumors of various sizes, shapes and colorations, also of areas of hyperpigmentation. In some areas they are so closely set that they are practically confluent. They are of many types. Some appear like small, soft moles; others are more firm, having nipple-like elevations on their summits. The lesions are situated on the back, chest, abdomen, face, neck, forehead, and the legs and arms, the largest tumors being present on the chest and abdomen. They vary in size from a pin's head to a small egg. The smallest tumors are button-like, of a light brownish color, are very soft and are covered with a wrinkled skin. The larger ones are pinkish in color and give the impression to the palpating finger of being fibrous and fatty. These tumors are covered with fine bloodvessels. Numbers of the large tumors are pedunculated, and seem to be hanging from the surface of the skin by the pedicle. Many small and large areas of brownish pigment, without elevation, are present. The largest of these is situated over the region of the right groin and measures about 12x3 inches. Others are present near the anal region on the right buttock, three are on the left side of the chest, and two on the right leg. There are no subjective sensations. The general health of the patient is unimpaired.

Severe strain and mental worry which lower the vitality must also be considered. Pressure of the collar-button may cause a furuncle. In some men, if the back of the neck is shaved when the hair is cut, a crop of small boils will always ensue. This is undoubtedly due to the loss of the protection which the hair normally affords, and as there are always present on the skin numbers of staphylococci, the collar rubs them directly into the mouths of the hair follicles and sebaceous glands and pustules result.

A large number of so-called blood purifiers and blood tonics depend on potassium iodid for the effect, and as this drug frequently produces a pustular eruption, their use naturally is often disastrous.

The pain is out of proportion to the size of the lesion, is worse at night and is of a burning, throbbing character which can be relieved only by evacuation of the pus, leaving an indurated nodule, very tender and frequently accompanied by intense itching.

First and always the urine should be carefully examined for albumin and sugar and the patient warned against any habits or occupations that might have an influence on the condition.

For furunculosis not caused by any constitutional condition Gaskill found the following treatment of great service: The end of a wooden applicator is sharpened to a fine point, wrapped with a small piece of raw cotton and dipped into pure phenol. Many men prefer the knife, but the "phenol stock" accomplishes the purpose; being slightly anesthetic, it is much less painful and the resulting scar is smaller, which is an important factor on the face. The phenol stick is inserted carefully where pointing occurs, held for a few seconds to allow the phenol to produce its anesthetic effects and then very gently pushed into the cavity. Extreme caution must be taken not to go beyond any resistance, or the protecting barrier that has been formed to limit the process will be broken down or a blood-vessel punctured. After an opening has been made sufficiently large to permit of drainage the following ointment is applied:

℞ Acidi salicylici ..... gr. xl vel lxxx
Petrolati ..... ℥j
Sig. Apply twice daily.

At the same time the first injection of staphylococcus vaccine should be given, 100,000 to 1 c.c.; at the expiration of four days the second injection of 250,000; in one week more 1,000,000 and again in another week the same dose. In extreme cases the succeeding doses may be 1,000,000,000 to 1 c.c., but this is rarely necessary. The injections are given into the loose cellular tissue between the scapulæ, and better results can be obtained if a dry cup is applied for five minutes before each injection. It will be noticed that the swelling at the point of injection is much more quickly absorbed by this method, through the increased amount of blood brought to the part. This also has the effect of preventing to a great extent, the discomfort that usually occurs after the first injection, as there is some headache, a feeling of lassitude and a slight rise in temperature, rarely above 100° F. These symptoms do not occur as a rule atfer the second and subsequent injections.

Treatment of Sycosis Contagiosa. According to C. H. Gordner[9] sycosis contagiosa is a true eczema of the hairy portions of the face. It frequently affects the hair-follicles, more especially the root-sheaths, and is accompanied by considerable infiltration of the tissue between the follicles. When the inflammation has reached the hair-follicles, pustules form, each pustule being pierced by a hair. These loosened hairs, while in the follicles, act as foreign bodies and must be removed before a cure can be effected. Hence, every hair must be removed and when epilation is performed, generally speaking, every hair will be accompanied by its root-sheath, swollen and loosened from its follicle. As the disease progresses toward cure large scabs form in spots, and it may be necessary, in order to hasten the cure, to incorporate subacetate in an ointment, using 30 grains to the ounce of simple cerate. Dermatologists recommend mercury bichlorid.

Treatment of Lupus Carcinoma. Norman Walker,[1] in lupus carcinoma, scrapes vigorously and removes everything which the spoon will bring away. He takes special pains to arrest the hemorrhage, even to the

(9) Med. Record, Dec. 10, 1910.
(1) Edinburgh Med. Jour., April, 1911.

length of applying adrenalin, as it is important that the caustic should reach as deeply as possible and not be obstructed by blood. In extensive cases an anesthetic is necessary, but now that we are familiar with this complication one should be on the outlook for it at a stage when it can be treated without this necessity. In more than one subsequent case he has recognized the earliest signs of the growth at a stage when it could be easily destroyed under local anesthesia. His usual plan in these cases now is to freeze the part with ethyl chlorid and finish the whole operation before the effects have passed off. Quite recently, he has treated early lesions by applications of carbon dioxid snow, and has every reason to be satisfied with the result.

Phtheiriasis. Celestin Huet[2] advises the following ointment:

℞ Methylene blue ..... gr. xxx
Distilled water ..... m. ccc
Dissolve the methylene blue and add—
Wool fat ..... ʒj
When the methylene blue is thoroughly incorporated, add—
Zinc oxid
Bismuth subnitrate
Petrolatum ..... āāʒiij
M. Fiat unguentum.

In children whose heads are not covered with impetigo use a lotion composed of equal parts of ordinary vinegar and Van Swieten's solution. (Van Swieten's solution is composed of one part of corrosive sublimate, 100 parts of alcohol and 900 parts of water.)

Another excellent application is equal parts of olive oil and petroleum, less inflammable than petroleum alone and non-toxic if absorbed by the broken skin. This mixture is cheap and procurable everywhere; it acts by asphyxiating the lice and has, furthermore, an excellent action on impetigo.

The Roentgen Ray in Dermatology. J. W. Riddell,[3] has had good results in the treatment of rodent ulcer, psoriasis, lupus, tuberculous glands at any stage, exophthalmic goiter, alopecia areata, leukemia, hyperidrosis, hairy and pigmented moles, nevi, deep-seated malignant disease, ringworm, and favus. Large and

(2) Jour. de Méd. de Paris, May 27, 1911.
(3) Brit. Med. Jour., Apr. 29, 1911.

frequent doses are necessary, precautions being taken against the possible terrible damage.

Uranium in the Treatment of Rodent Ulcer. A. Churchward[4] finds uranium calcium phosphate of value in rodent ulcer. After proving that uranium calcium phosphate is sufficiently radio-active, place a piece of lint over the ulcer and let the mineral rest on this for three hours each day, which time, after a week, can be increased to four or five hours. If any dermatitis is produced in the surrounding tissues interrupt the treatment for two days, and then apply the mineral for an hour, or two hours only, for the first week, after which increase the time gradually. Dermatitis in the surrounding tissues was set up once only after an exposure of five hours. It is wise to wrap a piece of lint or bandage round the mineral and to keep this on permanently because the yellowish-green crystals of the calcium phosphate of uranium are easily broken and detached from the matrix, and would therefore, depreciate the radio-active power of the mineral. This treatment is not expensive, as is the case with radium bromid, and is therefore within the means of any general practitioner. The mode of treatment is so simple that patients can be treated in their own homes, the case being left in charge of a nurse after the general practitioner has seen that the mineral is properly applied, and in the position required.

(4) Lancet, Mar. 11, 1911.

GONORRHEA AND CHANCROID.

GONORRHEA.

Gonorrhea in Women plays such havoc with female genitalia and its results require such radical surgery that prophylaxis is an urgent duty.[5] Owing to gonorrhea's frequent subacute character in women and its partial or complete freedom from urgent symptoms, many sufferers from the complaint look complacently upon the discharge, believing it to be nothing more serious than an unaccounted-for exacerbation of a leucorrhea. Not only for the patient's own sake is it imperative to resort to the most positive measures looking to a cure, but also for the sake of those men whom such a patient might embrace. Many female gonorrheics indulge with a large number of men. Thus gonorrhea in women may be a possible source of infection for a score. In the treatment of gonorrheic women there is a slovenly tendency on the part of many physicians to advise home treatment by douches of various sorts. Inflammation is rarely cured by this means; such treatment results in amelioration of the more marked symptoms, but cure is improbable.

Gonorrheic infections in women have not received the attention given to the same condition in men. The genito-urinary surgeon considers the disease as coming within the province of the gynecologist. The latter gives it but little consideration until extension into the peritoneal generative organs, with pus accumulations, demands surgical relief of a major character. By thus impinging upon the domains of both specialists and not recognized as belonging solely to either, gonorrhea in women has not been accorded the consideration its gravity warrants. When it is remembered that the serious remote results of gonorrhea are prevented by an

(5) Amer. Jour. Derm., March, 1911.

energetic, well-chosen treatment of the disease, while it is confined to the extraperitoneal regions, the need for such will be the better appreciated and much major surgery rendered unnecessary.

Treatment of Gonorrhea, advised by A. C. Magian,[6] consists in large (3 gallons) irrigations with 1-5,000 potassium permanganate solution, followed by a similar washing with distilled water, then three gallons of water containing one ounce of protargol, 30 grains of chlorid of gold in one quart of water and repeated irrigations with one-half per cent. protargol in the course of the next twenty-four hours. These irrigations are repeated in increasing strength on the second, third and fourth days. On the fifth day, use three gallons of weak sulphate of zinc solution, and on the sixth day a similar amount of weak nitrate of silver. The exact strength of these last irrigations varies according to severity. Cure is said to be almost invariably complete. In a few instances an additional day or two is required. Microscopic examination reveals no gonococci at the end of the week. There is no trace of any discharge. The urine shows no threads or any other deviation from the normal. Magian has used this in 100 consecutive cases, and in three instances only was cure delayed beyond the seventh day.

Thallin Sulphate in Gonorrhea, according to L. Russell,[7] is best used in a 1 per cent. solution. Thallin sulphate has an antigonorrheic action. It relieves the inflammation and changes the thick purulent discharge into a thin watery one in from one week to ten days. It should be used from four to six times a day, and it can be used still oftener to advantage. It is non-irritating and is very grateful to the patient. It is so soothing to the inflamed surface it makes urination much less painful after a few injections.

CHANCROID.

Hot Air in Chancroid and Phagedenic Chancre is discussed by E. W. Ruggles[8] who reports a case in a 33-

(6) Brit. Med. Jour., June 24, 1911.
(7) Amer. Jour. Derm., April, 1911.
(8) N. Y. Med. Jour., Dec. 2, 1910.

year-old man who had gonorrhea at 18 and 25 years. Four years previous to seeing Ruggles he had gonorrhea without extramarital coitus, the disease being attributed to an old stricture; six months before Ruggles saw him a small sore a few days after coitus appeared beneath the prepuce. This gradually enlarged for several months; later several ulcers appeared forming depressed scars. His physician who had treated him two months, slit up the foreskin. Three weeks ago the ulcers seemed healed, when suddenly they extended to the apex of the glans and began to destroy that organ.

On Nov. 23, 1909, there were found near the base of the glans penis, on the right side, two deep ulcers, about as large as peas, exuding considerable pus. Occupying the whole extremity of the glans was an ulcer, about three-quarters of an inch in diameter. which had eaten away over one-eighth of an inch of the urethra. The meatus was contracted and practically invisible in the deeply ulcerated and uneven surface. Urination was difficult and quite painful. The glands in the groin were moderately enlarged, but no other adenopathy was present nor had the patient had any eruption, mucous patches, sore throat, or loss of hair.

Ruggles cauterized the two small ulcers with carbolic and nitric acid, leaving the ulcer at the apex untreated to avoid the danger of contracting the meatus. The hot air treatment was begun the same day but he was unable to exceed 120° F., the ventilating aperture having been occluded by the bed-clothing. This being remedied the patient being something of a salamander, Ruggles maintained the temperature at 170° F. for about fourteen hours each day without discomfort. On Nov. 25, there was a decided improvement, the ulcers being partially sealed over, and the pus being much less abundant.

By Nov. 29, the two smaller ulcers were sealed over entirely and the greater part of the large ulcer. The latter was then cauterized with bromin, which Ruggles has found to be a valuable adjuvant in these cases, as it acts no deeper than the diseased tissues and seems to aid somewhat in the obstinate areas. The next day

the whole surface of the ulcers was sealed over, although a little seropurulent matter exuded from the largest one. Two days later, after washing the glans, Ruggles found that nearly the whole of the ulcerated surface was apparently healing. On Dec. 4, the large ulcer presented a healthy granulating appearance and the lips of a newly formed meatus about five-sixteenths of an inch in length, were visible; urination was painless and comparatively free. The two small ulcers were practically healed.

On Dec. 9 one ulcer at the base of the glans was permanently healed, and the other was reduced to only one-sixteenth of an inch in diameter. At this time the patient, who was a "boss painter" by trade, became restive, since his men did not do well without personal supervision. He began to be irregular with treatment, using the oven only from 3 to 5 hours a day. This neglect, together with the irritation caused by his walking and working seemed to light up the infection anew in the large ulcer, although the urethra was not again invaded. From this time the progress was much less rapid, and occasional cauterization with bromin was necessary. Granulations, sometimes too exuberant, necessitating the application of zinc chlorid solution, filled up the area which had been destroyed, until, at the date of ultimate healing, Jan. 4, 1910, nearly the normal outline of the glans had been regained. Urination was somewhat slow owing to the rigidity of the lips of the newly formed meatus.

On Jan. 13, the patient appeared with the symptoms, including numerous gonococci, of an acute gonorrhea. He denied coitus and said that the discharge had appeared two days after the ulcer had healed. He had at this date a large, boggy prostate, full of pus and gonococci, so that it is possible that a latent gonorrheal prostatitis existed. He was apparently cured in eighteen days and passed the beer and silver nitrate tests successfully, although when last seen his prostate still contained much pus.

SYPHILIS AND ALLIED DISEASES.

Syphilography during the current year has been most strongly evidenced in regard to arsenobenzol, now called salvarsan, and the diagnostic value of the Wassermann and Noguchi reactions. There has been less theoretic, but more valuable discussion of certain clinical and therapeutic phenomena. The diagnostic significance of the reaction has been rendered less absolute by cases indicating that in its use the etiologic moment rather than pure specificity must be recognized. Salvarsan is clearly passing through the stages indicated last year. Despite the charlatanish methods employed to exploit it, dangers from its use are clearly pointed out, both from its untoward effects and from the recklessness of its employment. In certain torpid intractable cases it has undoubtedly started a progressive improvement. Like all potent alteratives it has caused death and blindness and in some instances serious nerve accidents from vessel rupture through alterative strain. The study of trypanosome diseases allied to dourine (so-called "horse syphilis") yaws and kala-azar continues to afford valuable results. The Equidæ seem to have other trypanosome diseases than dourine, albeit their relation to coitus is not so evident.

Diagnosis.

Active Human Serum in the Diagnosis of Syphilis. F. B. Gurd[9] states that the natural complement-content of human serum can be utilized in the serum-test for syphilis if the serum be properly preserved and used when fresh. The natural hemolysin against guinea-pig corpuscles can be employed in the hemolytic series in infants. The results obtained in over 600 tests have been uniformly trustworthy and have fewer errors than

(9) Jour. Infec. Dis., July, 1911.

controls performed by the original Wassermann reaction and the Noguchi modification. Errors liable to give a false reaction, such as those occurring as a result of contamination of the serum with lipoids capable of binding the syphilitic antibody with the normal complement, giving a negative result with positive sera, are more readily noted if the complement present in the serum tested be determined at the time the reaction is performed. The fact that but very little agglutinin is present in human serum against guinea-pig corpuscles renders the reading of the reaction easier than by methods using an artificially induced amboceptor, since in the rabbit's serum a sufficiently large quantity of agglutinin is produced to clump the erythrocytes, rendering the identification of a partial hemolysis very difficult. If serum to be tested is preserved in a uniform manner, preferably two hours in the incubator and subsequently in the ice-chest, it will be found to maintain its complement-content usually for forty-eight hours and always for twenty-four hours. Older serum should not be used. For testing cases not adapted to examination by this method Gurd prefers the Noguchi system, utilizing quantities employed by Wassermann with inactivated serum.

Alcohol and the Wassermann Test. C. F. Craig and H. J. Nichols [1] have tested the effects of alcohol in 9 cases in which, before the alcohol administration, there was a double-plus Wassermann reaction. Of the 9 cases included in the table, 3 were in the secondary and 6 in the tertiary stage of the disease. The quantity of alcohol administered varied somewhat, but in every case the reaction disappeared after its administration. The smallest amount of alcohol administered was 180 c.c. of whisky containing approximately 90 c.c. of alcohol, and in most cases the blood was tested one hour before the administration of alcohol was begun as well as afterward. The study of the table will disclose the fact that in 5 of the cases the reaction was negative one hour after the last dose of alcohol had been given, and that in all the cases the reaction remained negative for sev-

(1) Jour. Amer. Med. Assoc., Aug. 5, 1911.

eral hours and in some of them for a much longer time. Thus in Cases 4, 5, and 6, the reaction remained negative for over twenty-four hours and in Case 9 for three days. Two of the patients had received arsenobenzol before the alcohol was administered, but in one case this was given so long before that it could have had no effect on the reaction, while in the other, the fact that the reaction became double-plus again after becoming negative from the alcohol administered, indicates that arsenobenzol had nothing to do with its disappearance.

At present it is impossible to explain this effect of alcohol on the complement-fixation-test. That it is not due to the actual presence of alcohol in the blood-serum tested is evident from the fact that a much larger quantity of alcohol is necessary to produce hemolysis than could possibly be present in the serum. For example, it was found that it requires at least 0.15 c.c. of absolute alcohol to produce complete hemolysis of 1 c.c. of a 1 per cent. suspension of human red corpuscles, within the standard time, whereas only 0.08 c.c. of the patient's serum is used in making the complement-fixation-test in the laboratory. It is thus evident that if the serum were absolute alcohol the quantity used could not produce hemolysis.

It is evident that in syphilis some substance is present in the blood-serum which reacts with a suitable antigen, and that this substance depends on the presence of the spirochetes, for when these disappear in experimental animals the reaction also disappears. This specific substance may be viewed as either an antibody produced by the reaction of the tissues to the living or dead treponemas or as a chemical substance. Alcohol has a profound effect on the protective antibodies which may be produced during the progress of syphilis or of other diseases.

These observations demonstrate that dependence cannot be placed on a negative Wassermann reaction in individuals who have, within twenty-four hours of the collection of the blood, ingested considerable amounts of alcohol, while in some instances the drug may render the reaction negative for as long as three days.

The authors have not, as yet, tried the effect of alcohol in smaller doses on cases giving a plus or plus-minus reaction, but it is probable that the drug will be found to have a still more decided effect on weaker reactions, and it is certain that with the amounts used in the experiments, the strongest positive serum would give a negative result. Careful inquiry, therefore should be made regarding the recent use of alcohol before collecting serums for the complement-fixation-test in lues.

TABLE ILLUSTRATING THE EFFECT OF THE INGESTION OF ALCOHOL ON THE COMPLEMENT-FIXATION-TEST IN LUES.

Case No.	Stage of Disease.	Reaction Before Alcohol.	Amount of Alcohol Given.	Subsequent Result of Test.
1	3	++	About 700 c.c. Munich beer.	—
2	2	++	90 c.c. of 95 per cent. alcohol by mouth.	—
3	3	++	240 c.c. of whiskey.	—
4	3	++	240 c.c. of whiskey.	—
5	2	++	180 c.c. of whiskey.	—
6	2	++	240 c.c. of whiskey.	—
7	3	++	240 c c. of whiskey.	—
8	3	++	240 c.c. of whiskey.	—
9	3	++	240 c.c. of whiskey.	—

The Wassermann Reaction and Temperature. H. Guggenheimer [2] finds that sometimes there is a negative reaction at room-temperature and a positive one at the freezing-point.

Non-Diagnostic Value of Giant Cells in Syphilis. According to J. A. Fordyce [3] giant cells play only a secondary rôle and are chiefly of interest because of the difficulties they present in a distinctive diagnosis from other infective granulomata, especially tuberculosis, and on account of their possible influence on treatment. Although many minor distinctions are made upon which to base a diagnosis between a tuberculous and a luetic lesion, in the majority of cases from the histology alone it is impossible to say to which class of infections the specimen belongs.

The Diagnosis of Concealed Chancre in the Male Urethra is discussed by C. M. Whitney [4] who analyzes 38 cases of urethral chancre in the male. It occurs in two types: First, where this condition alone is present,

(2) Münch. med. Wochenschr., June 27, 1911.
(3) Interstate Med. Jour., January, 1911.
(4) Med. Record, Jan. 28, 1911.

and second, where one has as a complicating gonorrhea or, as one of the cited cases shows, chancroid in addition. In those of the first class, there may be no symptoms of any severity; usually there is a discharge of a thin mucous nature, which on microscopic examination shows a few leucocytes and epithelium. There is sometimes but not commonly, a moderate purulent discharge. Dysuria is rare, there being usually only a little burning in urinating. The enlargement of the inguinal glands is not so marked as when the lesion exists upon the glans penis, due probably to the fewer lymphatic vessels. Urination is usually quite unobstructed.

The first symptom which calls the patient's attention to the disease is the appearance of the secondary symptoms of syphilis, especially the roseola, the sore throat, and headaches. Should these unfortunately happen to be of the very mild type, they may be overlooked, and the patient is exposed to the dangers of untreated syphilis. If the patient has had a relapsing gonorrhea with gleety discharge he considers the new discharge, if slight, of the same nature and treats it by capsules or else disregards it. He may not consult a physician at all. Several cases were first seen when a roseola appeared.

In the second class the patient usually applies early for the relief of his evident gonorrhea. The physician, seeing a profuse, purulent discharge, perfectly typical of this disease, may or may not examine the secretion for organisms. Whether he does or not, he applies the appropriate remedies for the disease, which gradually yields, and before the time for any secondary symptoms of chancre to appear the discharge has ceased, and the patient considers himself well. If the eruption then appear he may disregard it or consider it due to the medicine, or again he may then consult another physician who absolutely disbelieves his statement that he never had a chancre and places him under treatment. In this case both physicians are ignorant that they have been dealing with a concealed chancre. An eruption appearing during the treatment of gonorrhea may be due to the balsam of copaiba. One of the most per-

plexing cases that Whitney ever saw was one where there was at the same time a copaiba rash and the secondary roseola caused by a concealed chancre.

Whitney points out from his analysis that concealed male urethral chancre is difficult to diagnose. The classical symptoms of dysuria, marked urethral discharge and obstructed urinary stream are not commonly found. The majority of such cases may have, separately or together, a slight mucous or watery discharge, a flattening of the lips of the urinary meatus, a reddened zone of mucous membrane in this region, edema of the prepuce without obvious cause, and, most important of all, the presence of an induration of the tissues beginning at one or both lips of the meatus and extending usually to the fossa navicularis, its most common situation. John Hunter, from self-inoculation with such a chancre, held gonorrhea and syphilis identical.

The Diagnosis of Extragenital Chancre. W. S. Gottheil [5] urges the value of the following elements of differential diagnosis of extragenital chancre: The effect of the implantation of the syphilitic virus anywhere is the production of a tumor. Pus formation or ulceration is an accident that may or may not occur. Whether it forms a large mass or only a thin plate, it feels like a foreign body "let in" the skin, and gives a very dense and sharply circumscribed sensation on palpation. Painlessness is considered a sign of very great value, there being absolutely no pain in an uncomplicated and unirritated chancre. The rate of growth is moderately slow, taking several weeks to reach its full size, thereby differing on the one hand from herpes, chancroid and ordinary pus infections in which the lesion reaches its maturity in a few days, and on the other, from cancer, rodent ulcer, etc., which always take months and may take years to reach the size at which we see them. Local adenopathy, while not of very great value, is of some aid, the glands being less pronounced in size, the pain and tenderness being less, and there being no tendency for the glands to coalesce. The finding of the treponema,

(5) Arch. of Diag., February, 1911.

while of great value, cannot be carried out by every one, and the necessary procedures make this method of little value to the general practitioner.

Reinfection and Pseudochancre. W. Guttman[6] recalls the necessity for diagnosis between reinfection and certain secondary manifestations, not ignoring, however, recrudescence of pseudochancre in the scar of the primary lesion. He cites two cases where treatment resulted in a negative Wassermann reaction, but a second pseudochancre appeared in the old scar. In the other case the pseudochancre appeared in the urethra.

SYMPTOMATOLOGY.

Syphilis and Tongue Base Atrophy. D. Symmers[7] is of opinion as the result of systematic study of the base of the tongue in a large number of cases of smooth atrophy that one is justified in the opinion that there are at least two forms of the lesion to be differentiated by the unaided eye, while histologic observations indicate that both result from a simple replacement fibrosis such as syphilis is wont to produce in many other tissues. In neither form does there seem to be anything in the histology of the process to indicate that the condition is the sequence of the healing of ulcerating superficial gummas or of gummas located in the muscle tissue. Finally, it is not to be overlooked that in old age especially, and in cachectic and anemic subjects, the base of the tongue often presents changes which, upon superficial examination, may simulate smooth atrophy very closely, in that the surface of the tongue is pale, relatively flattened and smooth, the lymphoid structures being noticeably atrophied. But in these circumstances induration due to connective tissue replacement is lacking, a fact which serves at once to distinguish specific from simple atrophy.

In analyzing the records in 623 necropsies he found acquired syphilis in 75 cases, the diagnosis having been based upon the occurrence of characteristic secondary lesions in the skin or mucous membranes, the presence

(6) Berlin. klin. Wochenschr., July 10, 1911.
(7) Amer. Jour. Med. Sciences, December, 1910.

of atrophic pigmented cutaneous scars, gummas in different localities, and interstitial visceral inflammations, especially in the liver in the condition known as hepar lobatum, and in chronic interstitial orchitis; upon syphilitic aortitis—a condition characterized by the presence of elevated, circumscribed, smooth or finely wrinkled, hyaline patches at the commencement of the aorta and decreasing as the vessel descends in its course, and usually associated with marked fatty changes or calcification; or upon various combinations of the above lesions, or upon parasyphilitic diseases, such as tabes dorsalis.

Of the 75 cases of syphilis thus encountered, smooth atrophy of the base of the tongue occurred 64 times (85 per cent.). In 55 instances atrophy was complete, and in 9 instances partial, in that it was associated with the presence of small numbers of atrophic lymphoid follicles, while in 9 cases the lymphoid follicles were hyperplastic and in 2 cases the base of the tongue appeared to be well preserved. In the great majority of cases the base of the tongue was perfectly smooth or nearly so, scarring having been met with in a few instances only.

In 7 of the 75 cases of syphilis secondary lesions were present. In 3 instances these lesions were active, and in all of them the lymphoid follicles at the base of the tongue were hyperplastic, while in the remaining 4 the secondary lesions were well advanced in the process of healing. Of these latent secondary lesions, the base of the tongue was moderately atrophied in three cases, while in the remaining case the lymphoid follicles were hyperplastic. In 4 of the 75 cases parasyphilitic lesions were present, and of these the tongue was completely atrophied in 2. In the other 2 the lymphoid follicles at the base were enlarged. In 64 of the 75 cases chronic syphilitic lesions were present, and of this number the base of the tongue was completely atrophied in 52 (81 per cent.), partially atrophied in 7 (10 per cent.), unchanged in 2 (3 per cent.), and in 3 (4 per cent.) the lymphoid follicles were hyperplastic.

It is of some interest in this connection to note that

in 47, or 73 per cent. of the 64 cases of smooth atrophy of the tongue the spleen was markedly atrophied or degenerated, so that the lymphoid follicles were small in number and size and often totally invisible to the naked eye. Microscopic examination was made of the spleen in a considerable number of such cases, and the lymphoid follicles were invariably found to be small and poor in cells, while the walls of the vessels in the immediate vicinity were thickened and hyaline and their lumina partially or almost completely obliterated. Frequently the connective tissue was increased throughout. Whether this condition of chronic interstitial splenitis and atrophy of the lymphoid follicles be the expression of age and hence of the nature of a physiologic process, or whether it is histogenetically comparable with the sclerosing changes in the tongue is difficult to say. In 22 cases of syphilis the splenic follicles were distinctly hyperplastic, and in 6 of them there was associated hyperplasia of the lingual lymphoid tissues. Hyperplasia of the lymphoid tissues at the base of the tongue is not an infrequent phenomenon in the active secondary stage of the disease. It appears that these changes are often followed in the course of time by atrophy of the lymphoid follicles and by connective tissue replacement, the latter process sooner or later advancing to include certain numbers of the mucous glands and muscle bundles in the deeper portions of the tongue, contraction eventuating in the condition known as smooth, or better, perhaps, as indurative atrophy.

Histologic evidence does not support the view advanced by Lewin and Heller that smooth atrophy is the result of healing of ulcerating gummas; the process is rather a simple replacement fibrosis, occurring most often in late acquired syphilis, it is true, but nevertheless quite independently of regional gummas. In this regard it presents much that is common to syphilitic changes as observed in other tissues. Genuine indurative atrophy of the base of the tongue is invariably the result of syphilis. This opinion is based upon the systematic examination of the tongue in a considerable

number of both syphilitic and non-syphilitic subjects, and the author had yet to find a case of true indurative atrophy unassociated with definite anatomic signs of syphilis in some other part of the body.

On the other hand, however, there are numbers of cases of long-standing syphilis which present no evidence of atrophic, sclerosing lesions at the base of the tongue. In fact, the tongue in certain syphilitic individuals may be well preserved, or the lymphoid follicles may even be hyperplastic. Similarly, one often encounters simple smoothness and flatness of the base of the tongue in elderly, cachectic or anemic subjects, but the essential feature of smooth atrophy is lacking, namely, induration due to connective tissue overgrowth.

In approaching the diagnosis, both from the clinical and the anatomic standpoint, the finger should be trained to appreciate the degree of resistance offered by the base of the tongue and the sense of sight used only as an adjunct to that of touch. Failure to recognize induration in smooth atrophy is responsible for much of the doubt thrown upon the specific nature of the process, so that simple atrophic lesions, characterized by disappearance of the lymphoid follicles and partial replacement by fat, have been mistaken for genuine smooth atrophy. Two types of true smooth atrophy can be differentiated by the naked eye, one diffuse and characterized by induration and smoothness, the other insular and associated with the formation of isolated scars. The former appears to be the more frequent type. Microscopic examination of atrophic tongues from syphilitic subjects stained for *Treponema pallidum* by the method of Levaditi gave uniformly negative results.

Lues and Enlarged Glands in Children. Grasser and Dessauer[8] have studied the significance of enlarged cubital glands in children. In 1,066 nurslings, 1,000 were without lues, rickets or tuberculosis; of these, 4.6 per cent. had enlarged glands; 10 out of 15 congenital luetic cases had enlarged glands, but only one out of 14 tuberculous cases had enlarged glands. Twelve

(8) Münch. med. Wochenschr., May 25, 1911.

out of 29 rachitic cases had enlarged glands. 668 out of 831 older children had neither rickets, lues nor tuberculosis, yet of these 6.3 per cent. had enlarged glands. Four out of 14 congenital luetic cases had enlarged glands; 24 out of 106 tuberculous and 14 out of 43 rachitic cases were similarly affected.

Gummata. H. Curt [9] states that the typical syphilitic ulcer of the legs is an instance of gumma in the subcutaneous tissues or "cellular nodes" and is the most common illustration, perhaps, of the great tendency of such growths to ulcerate. Another familiar situation for such lesions, in women especially, is the subcutaneous tissue about the front of the knee, or arising in the bursa over the patella; and single or multiple ulcers in front of the knee are almost exclusively due to the breaking-down of gummata. The selection of such a site, in front of the knee, in women, is probably related to the performance of household duties, such as scrubbing floors. The occurrence of repeated slight injuries when kneeling frequently results in the enlargement of the prepatellar bursa, known as "housemaid's knee"; but should such repeated slight injury have preceded or followed specific infection, it is easy to understand why gummata in front of the knees should be more often met with in women than in men.

Varicose veins in the legs also are more common in women than in men, perhaps owing to the deficient support provided by the feebler calf muscles in women, who have to stand a great deal when at work, but largely because of the back-pressure such as must be associated with habitual constipation and pregnancy. Venous stasis leads to eczema and varicose ulcers, and the lowered vitality of the tissues in such damaged limbs affords an explanation of the text-book statement that tertiary syphilitic ulceration of the legs is more frequently seen in women than in men. As is known, **varicose ulcers** occur in the most dependent parts—the lower third of the leg—while specific ulcers are more commonly seen above this level. However, every one must have observed typical syphilitic ulcers in the

(9) Clin. Jour., Apr. 19, 1911.

lower third of the leg, and though these may occur independently of varicose ulceration, they are more often than not associated directly with and superposed upon, as it were, varicose ulcers. The exhibition of iodids at once heals the superposed syphilitic ulcers, while any coincident purely varicose ulceration may or may not improve.

Just before it ulcerates, the skin over a superficial gumma is of mulberry color, or of a purplish-crimson tint, crimson with a suggestion of duskiness; and the deep, punched-out ulcer, when it has formed, with circular margins or by fusion with other ulcers, serpiginous margins, indurated base, and floor covered with characteristic wet wash-leather slough, is familiar to all from earliest medical childhood.

Quite otherwise, however, is the recognition of the more deep-seated, non-ulcerated gumma, whether deposited in the skeletal or locomotor structures, the bones and the muscles including the tongue, or in the more vital organs of the body, the liver, brain, etc. The discovery of many of these is in the nature of a surprise, pleasant or otherwise. The consideration of the history and clinical features of some of these rather less obvious forms of gummata, involving the deeper structures or organs may serve to emphasize the value of keeping in mind the possibilities of such lesions, since in this way may be suggested an explanation where the question of diagnosis is difficult, or presents an element of mystery.

The author's cases comprise the following: Gummata about the knee and both shins in a patient with varicose veins; gumma of the pericranium and parietal bone at the seat of repeated injury, causing severe headache for years, followed by operation and cure; gummatous bursitis following injury, in a congenial syphilitic; acute syphilitic myositis; a lingual gumma; gumma of the liver; gumma of the liver excised by Godlee; a second gumma of the liver adherent to the cecum, removed two and a quarter years later; gumma of the liver complicating amebic liver abscesses.

Never omit to inquire carefully not only as to the

patient's present occupation, but as to his past modes of employment. Though the patient now be a farmer in a remote country-side, he may have previously been in service, or lived abroad. But let no occupation or social grade, high or low, cause disregard of any otherwise well-founded suspicion of the specific nature of the lesion in question, since, directly or indirectly, even the absolutely innocent may become the victims of infection.

Apart from the evidence provided by a clear history of infection, assistance is afforded by the presence of the scar of the primary sore, or of other well-known stigmata of the disease, *e. g.*, in the eye, fauces, palate, pharynx, etc., and the more or less pigmented scars on the shins and elsewhere, due to breaking-down gummata, or by the naked eye appearances already mentioned of the still unhealed ulcers.

Of course, there may be still present a superficial gumma, not yet broken down, which will give a clue to deep-seated disease. The physical signs in such a superficial growth will be a smooth, rounded, disc-like, or more or less hemispherical tumor or nodule, or it may be in the subcutaneous tissue, more or less incorporated with the skin over it, which, as the disease approaches the surface, becomes of dusky purplish or plum color. The node moves with the skin over the deeper structures unless these are also invaded. If the deeper structures be alone involved, the skin may at first be of quite normal appearance, and then moves freely over the muscle. But whether the gumma be subcutaneous or connected with the subjacent muscle, a dusky redness, edema and tenderness may be present and well marked, and this is increasingly so as the disease gradually approaches the surface. Later, the gumma tends to soften until fluctuation is distinct. This softening is very characteristic, and is the result of a necrosis of the tissue, probably chiefly owing to the presence of the specific toxin, and to a somewhat less degree to a deficient vascularity. The obliterative endarteritis, so often mentioned in text-books, is often noticeably absent in microscopic sections. This necrosis, so largely due to the destruction of the tissue-cells by the syphilitic toxin,

is comparable with the degeneration of medullated nerve fibers by diphtheria toxin, demonstrated, years ago, by Prof. Sidney Martin, F. R. S. In a gumma there is also, however, a well marked hyperplasia of the connective tissue, beginning in the walls of the vessels, and tending to strangulate them. The cyst thus formed contains fatty granules, cholestrin, and, later, from secondary infection, pus; and by breaking through the skin, an open ulcer is formed, possessing the well-known characters.

A history of syphilis may be absolutely wanting, or be stoutly denied, deliberately or from a complete forgetfulness of symptoms and signs occurring many years previously; or from lack of observation, or from the incorrect diagnosis by the patient or his medical attendant; or from the very transient duration of the rash, sore throat, etc. Many such rashes are dismissed as eczema, acne, etc., and everyone must have seen typical tertiary manifestations where no history could be obtained of infection or of secondary lesions. Manifestations occur though no history of syphilis can be obtained, although gonorrhea, many years previously, is frankly admitted. The possibility of coincident or subsequent infection with the specific spirochete may then not unfairly be entertained.

Another aid to diagnosis is a consideration of the region affected, for experience shows that the germ of syphilis, like that of tubercle, and probably for similar anatomico-physiologic reasons, exercises a selective action in its place of abode, certain regions or tissues being more frequently than others the seat of gummata. Generally speaking, making due allowance for the actual portal of entry, and the path of conveyance through the blood-vessels or lymphatics, or, as in the case of the tetanus bacillus, along the sheaths of medullated nerve fibers, such regions are selected because for some reason they afford areas of lowered resistance to invasion by the infective agent, whether it be the virus of syphilis, of tubercle, etc.

A subdivision of the previous heading, as providing a *locus resistentiæ minoris*, is a history of injury, such as

repeated blows on the scalp or limbs, or strains of muscles, the irritation of lip or tongue by a pipe-stem or a jagged tooth, or a previous non-specific disease, especially if aggravated by intemperance in the use of alcohol.

Jonathan Hutchinson, Jr., speaking of the bones involved most frequently in acquired syphilis, enumerates them in the following order: a. Nasal bones and septum nasi. b. Bones of the hard palate. c. Frontal and parietal bones. d. Clavicles, femora, bones of forearm. e. Sternum. Softening periosteal nodes on the anterior surface form the chief syphilitic lesion of this bone. He adds that "with regard to these and others bones, syphilitic nodes are often situated at, and involve the attachment of important muscles to the bone; thus, the insertion of the masseter muscle of the lower jaw, the origin of the pectoralis major from the clavicle, sternum, and ribs, the sternomastoid from the clavicle, the gastrocnemius from the femur, are all rather favorite sites for such nodes or gummata. The frequent strain of these muscles on the periosteum has very probably something to do with this fact."

This general principle as regards pyogenic organisms is illustrated in the case of a Swedish master-carpenter in Africa. His ribs on the left side were fractured by a piece of wood flying off from a circular saw in motion, and a traumatic empyema supervened. This was drained and eventually healed. A year or so later, when again up-country, the occurrence of a whitlow necessitated disarticulation of a finger of the left hand. The patient now returned with a recurrence of the left-sided empyema. Examination showed the disarticulation to be in a very septic condition, the cartilage over the head of the third metacarpal lying detached in the depths. With the successful treatment of the septic hand the recurrent empyema at once rapidly healed. In this instance traumatism gave rise to an empyema, and subsequently to hematogenous septic infection from a whitlow, of a region where the vitality had been previously lowered, resulting in a recrudescence of the empyema. This is in accordance with experimental

bacteriology. Dogs exhibit a remarkable resistance to infection with the staphylococcus, but this immunity disappears if, for example, a limb bone happens to be broken, the seat of a fracture providing an area of lowered vitality and a suitable nidus for the development of the germ. As with septic germs, so for the tubercle bacillus.

Enlarged submaxillary and cervical lymphatic glands are commonly associated with carious teeth, or adenoids, or chronically enlarged and septic tonsils, or otorrhea, or nits in the hair—nits causing irritation, leading to scratching, and thus to septic lymphadenitis. Danger arises when such a patient comes of tuberculous stock; for the lymphatic gland thus chronically enlarged by sepsis affords an area of lowered resistance, in which the tubercle bacillus finds a congenial environment for development, since the natural defensive mechanism of the part has been already damaged. There can be no doubt that cases of tuberculous glands in the neck are now few as compared with the great number observed some twelve or fifteen years ago; and this improvement is to be attributed not merely or only to improved hygienic conditions, but very largely to early and wholesale removal, especially amongst the hospital class of patients, of adenoids and chronically enlarged tonsils, so removing one great cause of chronic lymphadenitis, which, if not tuberculous from the first, eventually becomes so in those of a tuberculous diathesis.

Traumatism or disease in an organ or tissue previous or subsequent to infection by the specific virus, may, and often does determine the selection by the virus of that damaged organ or tissue for its development, resulting in the formation of a gumma. Out of 8 gummata at least 3 afforded definite evidence of previous injury or disease.

Psoriasisiform Syphilides and Psoriasis. Psoriasisiform syphilides, Brocq[1] points out, may closely simulate psoriasis from every point of view. In both instances there are well-defined papules of firm consistency covered with white, pearly, dry, stratified scales;

(1) Le Monde Méd., July, 1911.

PLATE XII.

An 8-year-old boy with nasal deformity due to hereditary syphilis. Adenoids were removed three years ago. The trouble with the nose began a year ago with nasal catarrh. Since May, 1910, the disease has progressed rapidly to complete destruction of the nasal bones. The patient up to July was treated for lupus. Since July the boy has received intramuscular injections of 0.2 gm. doses of salvarsan three times, at intervals of six weeks. There is marked improvement in both general and local conditions.

constituting the "candle stain" upon a red, smooth, shiny surface. Macroscopically it may be impossible to make out any difference. Then again it may be difficult to distinguish between certain cases of circinate psoriasis and some syphilides. A chancre or a few mucous patches and the distribution of the eruption may assist in diagnosis, but these aids may be wanting and do not exclude the possibility of psoriasis, and often elementary lesions occur macroscopically identical in respect of size, aspect, consistency and distribution. The clinician can make an exact diagnosis by the simple procedure of methodical scraping. This method is based on the differences between the histologic structure of the two sets of lesions.

Although these lesions form papular eminences on the skin, to all appearances identical, they are nevertheless built up of scales which in no wise resemble each other. Examination of the histologic preparations will show what well-marked differences of structure exist between these two types of papules. The lesions are identical so far as the corneal layer is concerned; in both instances there are copious scales made up of horny cells abnormal by reason of the persistence of their nuclei and laden with eleidin which gives them a pearly aspect. In psoriasis however, the last layers of corneal cells imbricate to form a coherent layer in the form of a thin detachable pellicle which is lacking in the syphilitic papule; nevertheless, beneath this same squamous covering are hidden very different lesions which can be properly identified only when this covering is methodically removed. As a matter of fact what especially distinguishes the two types of papules is that in psoriasis the entire lesion is confined to the epidermis whereas in syphilis the dermis itself is profoundly affected. The mucous corpuscles of Malpighi in psoriasis are notably shrunken in respect of the papilla to such a degree that when the scales are shed the summit of the papilla is separated from the surface only by a few epithelial cells. Between the papillæ, on the contrary, the epidermis sends elongated epithelial columns into the dermis so that although the epidermis has undergone modifications in its thickness the papillæ are preserved and regu-

larly distributed, forming a sort of festoon with long regular loops. There are no lesions in the dermis, and vessels with normal walls run between the collagenous fibers which provide a protecting sheath for them.

The syphilitic papule is very different. Here the epidermis is comparatively little affected; it is not markedly thinned but is rather stretched by the dermic infiltration, a distension which, moreover, has for effect, in addition to the deformation, an increase in size and even the disappearance of the papillæ. On the other hand the lesion is limited to the dermis, the structure of which is totally changed. In lieu of a fixed, solid, elastic tissue formed by fibroblasts filled with collagenous fibers the dermis is invaded by mobile elements, leucocytes of various sorts (lymphocytes, *Plasmazellen*) aggregated between the meshes of a not easily distinguishable reticulum which is the last vestige of fixed tissue. As to the vessels they show a profoundly altered, fragile endothelium; in fact the swollen endothelial cells have lost their reciprocal coalescence. These histologic data make out the marked differences that ordinary macroscopic examination would not reveal. Biopsy is not always possible, and necessitates rather tedious laboratory manipulations. The scoop enables us to obtain sufficient differentiation between the two types of lesion to form a rapid positive diagnosis available in daily practice.

Methodic scraping enables us to make a minute analysis of the elementary lesions by isolating, plane by plane, the various layers of the skin; in fact it is equivalent to a biopsy in which the sections are made in series, following a series of planes parallel to the surface, and in this way it teaches us the character of the scales, the thickness of the mucous bodies, the dry or exoserotic nature of the dermatosis in each one of the planes in proportion as the scoop penetrates the tissues. Scooping must be made to wear away the skin by gentle, regular scraping rather than by any coarse rasping. Under these conditions it plays a double part:

1. It progressively wears through the various cutaneous planes.

2. It damages, through the epidermis and dermis, the vessels running into the papillæ.

When rupture of the vessels takes place before the epidermic layer is worn through there is purpura; when the rupture of the vessels coincides with the opening of the papillæ there is hemorrhage. Three different factors intervene for the protection of the vessels: 1. The epidermis; according as its thickness is increased or diminished a greater or less number of applications of the scoop will be required to open up the vessels. 2. The dermis; normally the collagenous fibers protect the vessels so that their resistance will be enhanced in the presence of sclerosis of the dermis and diminished when the fixed tissue is replaced by mobile elements such as leucocytes. 3. The vessel walls; their fragility being increased when the flattened normal epithelium is replaced by swollen endothelial cells, they display very little coalescence between themselves. Production of purpura and hemorrhage will be considerably modified according to the nature of the lesions, so that close investigation of their characters will enable us respectively to trace the histologic lesion itself. Whether dealing with thinning of the epidermis or dermic infiltration with endothelial lesions, rupture of the vessels will be easily determined in either case. Thickening of the epidermis (lichenification), and sclerosis of the dermis or vessels, on the contrary, will increase their resistance and so delay the production of purpura. But methodic scraping will apportion the parts played by these various factors in the observed results and distinguish the epidermic lesions from the dermic lesions.

When dealing with a purely epidermic lesion culminating in a thinning of the epidermis (over the papillæ) as in psoriasis, the thickness of the mucous body may be so much reduced beneath the scales that the papillæ are denuded by the earliest applications of the scoop, giving rise to a first hemorrhage, even before the purpura has had time to supervene. This is the case in the adult forms of psoriasis. In younger forms of psoriasis, the thickness of the mucous body is less reduced in which event it is often possible, after a few applications of the scoop, to obtain a slight purpura, but its existence is very fugitive for with another applica-

tion or two of the scoop, the hemorrhage takes place. This is precisely the fundamental character of purpura dependent on thinning of the epidermic shield, the vessels and dermis having preserved their normal resistance. Rupture is possible only when the mucous body is already much thinned, and owing to this fact the scoop from this moment almost shaves the summits of the papillæ which are soon opened.

The results of the scraping are very different when, as in syphilis, the dermic and vascular lesions intervene to render the vessels more vulnerable. Even when the epidermis is still thick they rupture with the greatest readiness on the first few applications of the scoop. Numerous applications of the scoop will gradually wear the thick epidermis away while the purpura persists. The hemorrhage supervenes only later on. Not only is there early hemorrhage in syphilis but the purpura will be frankly first in sequence and separated from the second hemorrhage by a prolonged intermediate stage.

Minute observation of the sequence of phenomena occurring in the course of the scraping will consequently afford us precise data. Nevertheless, alongside the chronology of the facts we must also study the morphology of the purpura and the hemorrhage. The form and the distribution of the purpuric points teach us in fact very accurately the state of the papillæ in which the blood runs as into a mould. In psoriasis the papillæ are preserved, moreover they are narrow and regular. The purpuric or hemorrhagic points form a fine sprinkling of equal, regularly distributed points. In the syphilitic papulæ on the contrary the papillæ are distended by infiltration and may indeed have altogether disappeared. In this case there is nothing to dam back the hemorrhage, and the red corpuscles little by little escape from the ruptured vessels and spread out beneath the epidermis giving rise to irregular, unequal purpuric points over the surface of the papule. Moreover this purpura is progressive, the spots spontaneously increase in size and end by running more or less into each other forming a patch of ecchymosis.

The instruments required for methodic scraping are

simple enough. Dermatologists used to make use of the nail for scraping psoriasis, since this had the advantage of giving exact sensation in respect of the force employed and, when blunt, did not excoriate the teguments. This method however is not without danger both for the patient and the doctor. It is better to make use of a Vidal scoop, widely open, with blunt edges. A glass slide or an Unna compressor and a cigarette paper are also required. We must lightly and methodically scrape the surface of the papule because it must be borne in mind that our object is to isolate the histologic planes, and that a rough exploration (such as is so often brought to bear) may forthwith excoriate and cause bleeding of the lesion. First of all apply the glass compressor so as to make sure that, on the papule rendered exsanguine by the pressure, there is neither purpura nor hemorrhage. Then holding the curette in the right hand, like a pen, without any stiffness, and imparting as much suppleness and lightness to the fingers as possible, fix with the fingers of the left hand the area of skin to be explored, then slowly, methodically, make light applications of the scoop and after each application examine with care in order to see what changes have taken place in respect of the lesion. The data thus obtained must be noted with the application of the scoop. Stop as soon as anything happens. In this way, after a few applications of the scoop, apply the glass compressor; at the onset nothing appears on the surface of the papule rendered bloodless by the pressure; next purpura occurs with little red patches often as fine as pins' points which stand out on the white ground. To make sure of the purpura not bleeding interpose between the papule and the compressor a leaf of cigarette paper which should remain unstained. The hemorrhagic dots, on the contrary, become more distinct by this maneuver forming as they do little red stains on the cigarette paper.

In certain cases, when the scales are fine and the teguments fragile, the scraping must be done so lightly that it is necessary to hold the scoop between the thumb and index finger, merely steadying the stem with the ring and little fingers, passing it in this position slowly

over the teguments without losing patience, several times over and watching carefully for the least visible change. Proceed with this exploration very methodically and without haste; do not excoriate the skin and do not remove the squamous layer by a single sharp application. Do not try to make the teguments bleed, for what cutaneous lesion would resist such treatment? It can always be made to bleed if we try. Do not remain satisfied with a single exploration, but scrape several eruptive elements. They should be chosen preferably young and pure, unadulterated by topical applications and traumatisms, but it is also well to explore adult, fully developed lesions.

The points of special importance in the diagnosis of psoriasis and psoriasisiform syphilides are the different characters that are to be observed in the mode of production and the form of purpura and the hemorrhage.

Bear clearly in mind that it is not so much the actual number of applications of the scoop that are given before producing this purpura or hemorrhage that is of importance. These figures are of no value *per se* because they vary in each subject and according to the manner in which the scoop is used. The most important point is to scrape regularly and evenly. In this way we shall display manifest differences in the relationship between the number of scoop applications that determine purpura and hemorrhage one after the other. The earlier applications of the scoop bring away the scales allowing us to form some idea of the changes in the horny layer; we must watch how the last cuticle comes away, but it is especially when we reach the mucous body that our whole attention must be concentrated thereon. Some time always elapses, corresponding to a certain number of applications of the scoop, before anything happens; on applying the compressor the lesion shows neither purpura nor hemorrhage; this is the latent stage. Then purpura supervenes and the scraping is continued until we get hemorrhage. Now between the time when the purpura began and that of the occurrence of the hemorrhage there is a period during which occur a variable number of scoop applications. This is

the intermediate stage corresponding to the opening up of the mucous body.

When the latent stage is curtailed (as a means of comparison we can select a portion of healthy integument, only we must take a symmetrical region where the skin is equally fine), and purpura presents itself early, we may conclude that the epidermis is thinned or that the dermis has lost its normal resistance, the fixed fibrous tissue being replaced by an infiltration of mobile elements. If, on the contrary, the latent stage is prolonged it means that the epidermis is thickened (lichenification) or that there is sclerosis of the dermis.

To apportion the significance of the dermic or epidermic lesions study the intermediate stage; for instance in syphilis and psoriasis the purpura is seen soon after the shedding of the scales, the latent stage being short; but while in syphilis the intermediate stage retains its normal value, the purpura being due to fragility of the vessels and of the dermis, and not to thinning of the epidermis, in psoriasis on the contrary, where the epidermis is markedly thinned over the papillæ, the intermediate stage is much curtailed, being represented it may be by two or three applications of the scoop between the onset of the purpura and the appearance of the hemorrhage; indeed, very often in adult psoriasis the epidermis is so much thinned that the purpura has no time to reproduce the latent stage and overlaps the intermediate stage and the appearance of the first hemorrhage.

In respect of the histologic structure of the papules of psoriasis and syphilis not only study the sequence of the phenomena but also their morphology. During the intermediate stage it is best now and then to intercalate a cigarette paper between the compressor and the lesion to make sure that the purpura and not the hemorrhage is being dealt with. Look closely to see whether these purpuric dots are fine, regularly distributed, and of equal size. They may increase a little but still remain very small and incapable of running together (psoriasis); if, on the contrary, they appear one after the other in the form of very unequal spots, irregularly distributed, progressively increasing in size they end by run-

ning together in the form of a patch of ecchymosis (syphilis). With regard to the hemorrhage, moreover, distinguish between that occurring in the form of fine dots and that in a sheet.

Syphilitic Rectal Stricture. E. H. Tuttle [2] states that outside of the presence of gummata and certain changes in the blood-vessel walls, there is practically no difference in the pathology of syphilitic stricture and those due to any other inflammatory cause; the process is identically the same, the destructive ulceration extending down into the muscular walls of the gut, the extension of the inflammatory process along the line of intermuscular fibrous bands, a crowding out of the muscles by hypertrophy and increased deposits of fibrous material, and the subsequent persistent contraction of these deposits, reducing the caliber of the gut and interfering with the return circulation in the veins; these compose the practical pathology of stricture, whether it be syphilitic, tuberculous, or simply inflammatory. It has been known for many years that the ulcerative process in this condition was chiefly below the stricture and not above, as has been stated by so many theorists, and said to be due to the friction caused by the passage of hard fecal matter. There is sometimes an erosion and irritation above the stricture, but this can be easily handled by dilatation and by keeping the fecal masses soft. Not so, however, with the ulceration below.

All forms of treatment, whether local or constitutional, fail in the treatment of ulcers below the stricture except radical surgical procedure. The explanation of this lies in the fact that the contractile fibrous stricture limits the normal blood-supply and obstructs the return flow through the superior hemorrhoidal veins to such an extent that there is an abnormal circulation in the part, a deficient quantity of new blood and a stasis of what does go into the parts in the hemorrhoidal veins, thus preventing spontaneous healing or a normal response to local and constitutional measures.

This explains why in syphilitic strictures constitutional remedies have practically no effect, but they are

(2) Boston Med. and Surg. Jour., Feb. 15, 1911.

in no wise due to the obstinate syphilitic nature of the ulcer; the condition is the same whether the patient be syphilitic or not; the ulcers do not heal in either case until the obstruction to circulation be removed. Practically, syphilitic strictures differ very little from other strictures. Stricture in the rectum of syphilitics varies from that in non-syphilitics just as ulceration in any other part of the body differs in syphilitics and non-syphilitics. In other words, the changes in the vein-walls, the increased round-celled infiltration interfering more or less with the circulation of the parts, prevent response to ordinary medicine. Constitutional medications may affect these conditions, but they in no wise affect the fibrous tissue in the syphilitic any more than in the non-syphilitic. This condition once present is not amenable to constitutional treatment.

Syphilis and Cardiac Disease. The importance of spyhilis in the etiology of cardiac disease is according to V. Bie [3] underestimated. In 11 tabetic cases aortic insufficiency was present in 2 instances. Fourteen out of 17 cases of aortic aneurysm had evidence of syphilis. The Argyll-Robertson pupil was present in 16 cases. The knee-jerk was absent in 3 cases. Tabes was therefore suggested. In the whole hospital population the knee-jerk was absent in 27 of 511 patients. In this group 8 had tabes and 3 dystrophy of the muscles, alcoholic neuritis or paraplegia. The remaining 16 patients had either pneumonia or malignant disease of the stomach, with the exception of a child with mitral stenosis and a woman with chlorosis. Examination of the total pneumonia records showed that the knee-jerk was absent or feeble in 49 per cent. of the patients; this demonstrates that pneumonia alone is liable to abolish the knee-jerk. In the 23 cases of aortic valvular defect there was a history of acute articular rheumatism in 9, and of tabes in 3, while there was a history of syphilis in 4 others. Only one of the 7 patients with aortic insufficiency for which no explanation was evident was of an age to suggest the possibility of syphilis; the others were near or under twenty.

(3) Ugkskrift f. Læge, Mar. 9, 1911.

Similar analysis of the group of 85 patients with myocarditic or coronary disturbances showed that 11 were certainly and 4 probably syphilitic. Among the 187 cases of mitral defects at the hospital in the last ten years, acute rheumatism or chorea was known in the history of 120 of the 160 examined, and scarlet fever, pneumonia or puerperal fever in some of the other cases, but nothing of syphilis except in one case. The average age of the patients with mitral defect was 30, while with syphilitic or aortic disease it was 42, for aneurysm of the aorta, 50, and for syphilitic myocardium it was 52; hence there is an interval of fifteen years between the development of these affections on a rheumatic and a syphilitic basis. Syphilis attacks preferably the aorta and myocardium, while it spares the mitral valve. The connection between tabes dorsalis and heart disease in syphilitics is evident from the aortic disturbances so frequently noted in patients with tabes, but still more by the frequency of symptoms of tabes observed in the course of heart or valvular affections, the absence of the pupillary reflex in particular. The cardiac affections in question are more closely allied to the parasyphilitic than to other kinds of late syphilitic affections.

Congenital Cardiac Syphilis, according to A. S. Warthen,[4] occurs most frequently in the form of a diffuse interstitial myocarditis, due to the presence of the *Treponema pallidum* in large numbers, without ordinarily producing characteristic microscopic changes, so that the absence or presence of congenital cardiac syphilis can be told only by a thorough microscopic examination of the heart wall.

Liver Syphilis according to M. Goldsmith [5] is rather infrequent in the adult as determined by necropsies, but of the children dying prematurely 40 to 70 per cent. have liver syphilis. The anatomic types are diffuse interstitial nephritis, usually congenital. The liver is enlarged very firm, grayish-yellow or flint-colored. The gummata are large or small opaque white tumors, firm or solid. The cut surface resembles a cut potato, but is much denser and harder than tubercular, cheesy mat-

(4) Amer. Jour. Med. Sciences, March, 1911.
(5) N. Y. Med. Jour., Dec. 10, 1910.

ter. Around the gumma is a zone of connective tissue, outside of which is a zone of translucent tissue, representing the small-celled infiltration of the advancing syphilitic process. In fresh gummata the three zones are easily recognized; in old processes, the translucent zone is absent. Gummata vary in size from 3 to 4 mm. in diameter, to twice the size of a fist, and in number from one to ten or twelve. They may undergo retrogressive changes, disappearing completely and leaving only a fibrous scar; softening may occur in the center, either from the breaking down of necrotic tissue or occasionally from septic infection. Calcification may occur. The rare diffuse calcification in wide liver areas may have this origin.

Of scarred or botyroid liver there are several varieties: a. Small puckered depressions, with perihepatitis but with little deformity. b. One or both lobes may be divided by bands of fibrous tissue, radiating from the hilus or following the branches of the portal vein. In extreme cases the whole organ may be lobulated (botyroid), or large areas may be completely isolated, or the lobe may be made up of three or four sections united by flat bands of connective tissue. In the congenital form, there is an enlarged abdomen due to enlargement of the liver and spleen, and usually associated with other signs of lues. A second vastly more interesting variety is that in which a child is born healthy and remains so for a number of years, then develops obscure abdominal symptoms which finally crystallize into the picture of hepatic syphilis.

The clinical features in adults are as follows: 1. With features of hypertrophic cirrhosis; pains in the hepatic region, slight jaundice, a much enlarged liver, usually tender and slightly irregular, but perhaps quite smooth. 2. Resembling atrophic cirrhosis; recurrent ascites, enlarged spleen, and all the usual features of hepatic dropsy. The portal obstruction may be due to gummata pressing on the portal vein or its branches, or it may follow cicatrization. 3. Hepatic tumors; there may be large tumors in either the right or left lobe or multiple nodules on the surface; these are usually painless and may remain so for months, or even two or three years,

and this slow growth with a coincident enlargement of the spleen and the very slight cachexia, constitute important diagnostic points against carcinoma. 4. Amyloid liver; this is usually found in old cases with bone necrosis and extensive gummatous disease, the liver and spleen being greatly enlarged, albuminuria and dropsy being present, and the characteristic features being mostly those of renal disease. Rolleston reports one case in which the liver weighed eight and a half pounds. 5. Cases resembling liver abscess; there are enlargement, fever, slight jaundice, tenderness and if a tumor is present, the suspicion of an abscess is very great. Sometimes an abscess is secondary to a gumma.

The patient, a 34-year-old white, had acquired syphilis nine years before coming under observation, for which he had been treated irregularly in various ways not excluding the Hot Springs. He came under Goldsmith's care Sept. 18, 1909. Up to Aug. 1 of that year he had been a healthy, jolly, care-free fellow with a large capacity for work (traveling salesman), and scarcely knowing what it meant to feel sick. About that time (seven weeks before) he began to feel heavy and tired, his head was not as light and clear for work as usual, he had a disagreeable taste in his mouth, and thought his breath smelled badly. A few days later, he noticed his skin becoming yellow. He consulted a physician and was told that he had jaundice and was given several courses of calomel and salts. The jaundice deepened, he began to lose weight, and while he had no pain, the sense of general discomfort and disagreeable digestive symptoms increased. He was advised to go to French Lick Springs, where all the symptoms increased. The completely obstructive character of the jaundice was shown by the appearance of clay-colored stools. After five weeks diarrhea set in, and with it biliary coloring matter reappeared in the stools. During this time, accompanying these symptoms, there was a steady loss of weight, amounting to fifty pounds or an average of a pound per day. At no time had there been abdominal pain.

The patient when seen by Goldsmith was extremely

jaundiced. With the dark olive hue, bronzing was associated. The tongue was heavily coated, the breath very foul. The face showed marked emaciation, the limbs less so, while the abdomen had a fairly well-preserved panniculus adiposus. Liver dulness extended from the top of the fifth rib to two fingers, breadth below the costal margin. The edge could be made out as greatly thickened, hard and not tender. The inferior surface seemed to project downward and forward, as though the body of the organ was greatly thickened. This feature was not limited to any definite area or areas but was characteristic of the entire viscus, so much as could be palpated through the still thick abdominal wall. The spleen was not enlarged, nor was there enlargement of the superficial veins or lymphatics. There was neither ascites nor edema, and nothing abnormal was found in the thoracic organs. The urine was dark with biliary pigments, and contained a large number of bile-stained hyaline and pale granular casts; there was no albumin, sugar, or indican. The blood-examination showed hemoglobin, 75 per cent.; red blood-corpuscles, 4,144,000; white blood-corpuscles, 11,000. With a loss of weight of fifty pounds and undoubtedly some affection of the liver as part of the pathology, the presence of an additional pancreatic involvement naturally suggested itself. The stools were described as occurring six to ten times in twenty-four hours, the color of mustard and appearing in small pieces about the size of very coarse shavings. The patient persistently refused to bring a specimen. The urine, examined twice for the Cammidge reaction, was found positive. While this question unfortunately could not be definitely settled, the great loss of weight, the diarrhea, bronzing, and positive Cammidge reaction constituted at least highly presumptive evidence of associated involvement of the pancreas.

Syphilis of the Nervous System. *Syphilitic Anterior Poliomyelitis in Adults.* Goldflam called attention to this in 1893. It appeared early in the secondary period, and hence was not a parasyphilosis. Nonne has had 3 recoveries under mercury. Hoffmann's 2 cases were improved. Zadik [6] has lately reported two recoveries under

(6) Berlin. klin. Wochenschr., July 10, 1911.

mercurial treatment in typical cases, appearing during the early secondary period when biochemic rather than gross lesions result.

Fluctuations in Nerve Syphilis. J. Benario [7] analyzes 76 cases under various treatments, and concludes that the phenomenon has no relation to the treatment adopted.

Syphilitic Anamnesia. Under this title F. R. Fry [8] reports a case of mental confusion due to syphilis in a 40-year-old Eddyite who had an attack of hypomania. Ten days' treatment in a hospital for insane caused rapid improvement. At this time there still remained the euphoria of hypomania, with unequal pupils, asymmetric reflexes, and temporary attacks of mental confusion. Her father had contracted syphilis and had infected her mother, herself, a little girl, and another child.

Syphilis in Rabbits is stated by Uhlenmuth and Mulzer [9] to have been produced. They claim the following as evidence: 1. The characteristic period of incubation, more or less long, which precedes the disease; 2, the characteristic picture, very similar clinically and pathologically to that of manifest human syphilis, particularly of the hereditary form; 3, the presence of the *Treponema pallidum* in the morbid products and in the blood; 4, the possibility of transferring these morbid products not only to other rabbits, but also to monkeys, guinea-pigs and goats, and their almost regular production of the same morbid products after a characteristic period of incubation; and the fact that human syphilitic serum may be successfully inoculated into rabbits and from them intravenously into monkeys with the production of grave general symptoms and skin lesions containing spirochetæ; 5, the gravest forms of testicular and general disease are caused to disappear by means of specific treatment. For this purpose Uhlenhuth employed atoxyl, mercury atoxylate, and arsenobenzol.

(7) Berlin. klin. Wochenschr., June 28, 1911.
(8) Interstate Med. Jour., November, 1910.
(9) Berlin. klin. Wochenschr., Apr. 9, 1911.

TREATMENT.

Arsenobenzol Injections in the Lumbar Region. From arsenobenzol lumbar injections S. J. Meltzer[1] found that secondary and tertiary manifestations disappeared in a surprisingly short time. Regarding the Wassermann reaction, he obtained information only in certain cases; of these, in 6, the reaction remained negative and in one it remained positive. In 10 of the 12 cases no palpable reaction followed the intralumbar injection. Of the remaining 2 cases, in one a moderate edematous swelling in the lumbar region followed the injection which completely disappeared; regarding the local reaction of the twelfth case he received no information. It was administered in most of his cases as a weak alkaline, fine suspension, and in a few instances alkaline solutions of the remedy were employed. When the intralumbar injection was made strictly intramuscular, the pains which occurred during or following at any time after the injections were neither in extent nor in character important enough to be considered a complicating factor. The sacrospinal muscle presents anatomically an exceptionally well-isolated, large, compact mass, densely packed with fine muscle bundles. Any solution or suspension injected strictly into this mass will remain there and not affect locally the adjacent tissues. Experimentally it was shown that the absorption from this muscle is superior to that from the gluteal muscles and vastly superior to that from the subcutaneous tissue. Clinically it was established in a limited number of cases of syphilis that arsenobenzol injected into this muscle exerts a fairly rapid, unmistakably beneficial influence upon secondary and tertiary manifestations of syphilis and upon the Wassermann reaction without causing pain and other ill effects deserving any serious consideration.

Salvarsan in the Treatment of Congenital Cardiac Syphilis, according to A. S. Warthin,[2] cannot be expected to cure with one dose. Goldenburg and Kaliski, from their observations, conclude that the indications for the use of salvarsan cannot be absolutely formulated,

(1) Med. Record, Mar. 25, 1911.
(2) Amer. Jour. Med. Sciences, March, 1911.

but they believe that fresh cases of syphilis should be given the benefit of treatment with "606," provided there are no contra-indications. Cases of malignant lues, those refractory to mercury, or having an idiosyncrasy to it, and patients with gummata of vital and important structures, where a rapid dissolution of the lesion is necessary to save life or prevent marked destruction of tissue, are proper cases for the use of salvarsan. At the present time they do not believe that every case of lues with a positive Wassermann reaction, but without manifest symptoms of the disease, should be given salvarsan, in view of the fact that a large number of the cases treated with the drug persist in giving a positive Wassermann reaction months after the lesions have disappeared. The idea of a *therapia sterilisans magna*, which, as Unna says, is a royal thought, worthy of Ehrlich, will, they fear, have to give way to a *sterilisans fractionata*. That the spirochetæ in the superficial lesions have been demonstrated to disappear within twenty-four hours in many cases, they can testify to, but that they can be removed from the body as a whole in one coup, especially with the present mode of application and dose, they believe to be unattainable.

Arsenobenzol in Ear Syphilis is discussed by G. Alexander [3] who advises caution in cases of acute syphilitic disease of the auditory nerve. Especially is caution to be recommended in acute or chronic disease of the auditory nerve in cases of recent syphilis, as here it is to be feared that the ear symptoms will be made worse. It appears to make no difference whether the disease of the auditory nerve is of itself of syphilitic origin or not. An unfavorable influence is also to be feared in cases of acute syphilitic affections of the auditory nerve in old cases of syphilis or latent chronic syphilis. In cases of hereditary syphilis it is also suggested that in the presence of acute manifestations of trouble with the auditory nerve one wait before giving the Ehrlich-Hata injection.

On the other hand, there are a large number of cases of ear disease in which the dangers from the arseno-

(3) Boston Med. and Surg. Jour., Mar. 9, 1911.

benzol injection cannot be considered as dependent upon it. Here belong the cases of chronic syphilitic affection of the auditory nerve with slight diminution of hearing power and considerable tinnitus, as well as the cases of chronic labyrinth dizziness. In these cases Alexander has had good results from treatment before the time when "606" achieved good results. The Ehrlich-Hata remedy has a good effect in cases of chronic labyrinthine disease in chronic syphilis. The good results reported by Urbantschitsch in a case of hereditary syphilis and in 2 cases of cochlear disease and chronic syphilis should encourage physicians to proceed farther along the path already laid out.

Arsenobenzol in Eye Syphilis. In 9 cases of syphilitic interstitial keratitis reported by Loehlein [4] no therapeutic result was obtained by salvarsan. The extension of the disease to the second eye was not prevented by the remedy. Even the local use in subconjunctival injections was of no benefit. Arsenobenzol enters the cornea, because its presence there has been demonstrated experimentally twenty hours after intravenous and subcutaneous injections.

Untoward Effects of Arsenobenzol. R. Weiler [5] found that several patients complained shortly after injection of difficulty in urination, and that this condition persisted in one patient for several days. Obstipation was also noticed a number of times. Many complained of a great feeling of thirst and the appetite was often poor for a few days. He did not notice any notable effect on psoriasis vulgaris, lichen planus, warts, or pointed condylomata. Of the 206 patients treated only 40 could be kept under observation, and among these were 14 recurrences.

Cancer from Arsenobenzol. Jonathan Hutchinson [6] basing his opinion on an extended experience with arsenic in the dermatoses whose use resulted in malignant disease and a similar experience of other physicians, advises care in the use of arsenobenzol. He says that but little has been alleged respecting the new rem-

(4) Münch. med. Wochenschr., Apr. 18, 1910.
(5) Münch. med. Wochenschr., Dec. 13, 1910.
(6) Brit. Med. Jour., Apr. 29, 1911.

edy which is not equally true of mercury and the iodids when properly and boldly used.

Morrina.

Morrina: A Trypanosome Equidæ Disease. A recent Panama epihippic resembled, according to S. T. Darling,[7] other trypanosomal diseases, nagana, surra, mal de caderas, and Senegambian horse disease; but it presented a distinct group of symptoms. It is distinctly a disease of mules and horses. Cattle are insusceptible. The pathogenic agent, *Treponema hippicum*, has morphologic and biologic characters differentiating it from other trypanosomes. The chief distinguishing features of the disease are: anemia, weakness, emaciation and edema, conjunctival ecchymoses, conjunctivitis, pyrexia and some posterior paresis. The pathologic findings are constant and characteristic: splenic capsular ecchymoses, acute hemorrhagic nephritis, with acute glomerulitis and petechiæ; hemorrhages in renal lymph-nodes, epicardial and endocordial ecchymoses, and less constantly pleural, peritoneal, and conjunctival ecchymoses, and pleural effusion. The blood changes are those of anemia with lymphocytosis. There is much phagocytosis of blood-pigment by the endothelial cells of the liver and spleen. Darling believes that the disease is transmitted by flies through cuts and various wounds. Saddle horses were not infected. Animals were not infected by *Stomoxys calcitrans*, tabanids, ticks, or gnats.

(7) Jour. Infect. Dis., June, 1911.

GENITO-URINARY MEDICINE AND SURGERY.

The Penis.

Embryogeny of the Prepuce and Surroundings. G. H. Edington,[8] in a contribution to the developmental pathology of the prepuce, points out that on the under (caudal) surface of the genital papilla the cloacal plate forms a mesial ridge, extending forwards to the apex of the papilla, where it forms an epithelial horn, produced by a thickening of the surface ectoderm. The urogenital opening results from a breaking through of the cloacal plate behind and at the base of the genital papilla. On the under (caudal) surface of the genital papilla the cloacal plate forms a mesial ridge, extending forwards to the apex of the papilla, where it forms an epithelial horn, produced by a thickening of the surface ectoderm. The urogenital opening results from a breaking through of the cloacal plate behind and at the base of the genital papilla. By a loosening of the central cells of the mesial ridge, derived from the cloacal plate in front of the urogenital opening, a groove is produced running on to the caudal face of the genital papilla. This is the urethral groove. The groove is closed from behind forwards to form the spongy portion of the urethra, and the line of junction of the lips of the groove (inner genital folds) is indicated externally by an epidermal ridge—the raphé. The mesoderm of the lips of the groove, passing across the line of junction, completely separates, in the normal course of development, the urethra from the epidermis, except anteriorly at the meatus.

The development of the prepuce must be considered from two standpoints—(1) its external conformation, and (2) its separation internally from the glans. As re-

(8) Glasgow Med. Jour., August, 1910.

gards (1), the presence on its under surface of a raphé, continuous with that of the penis and terminating in the frenum, points to the prepuce being originally open below, and so forming there the anterior extremity of the urethral groove. Its closure is brought about by the coalescence of the inner genital folds which form the lips of the groove. That there must subsequently be a growth forwards of this part of the prepuce is shown by the fact that at birth the raphé is present on the most anterior part of the prepuce, which is well beyond the tip of the glans, and it runs back thence on the inner surface of the prepuce to terminate at the frenum. (2) The differentiation of the prepuce from the glans is brought about by an ingrowth, at the distal end of the genital papilla or tubercle, of epithelium from the skin covering the tubercle. This ingrowth "sculptures out the glans from the overlying skin. The cell invasion also burrows into the glans itself and forms the urethra (at first as a solid plug) within the glans." The central cells of the urethral plug break down and form the terminal portion of the urethra, a process which is completed by the seventh month. The epithelial ingrowth between the glans and the skin covering it splits into two laminæ by the breaking down of its central cells. A space lined by epithelium is thus formed between the skin and the glans. The outer lamina forms the epithelium of the mucous layer of the prepuce, and the inner lamina forms the epithelium of the glans, continuous at the meatus with the urethral lining. The separation into two laminæ is scarcely begun by the seventh month, and frequently is not complete at the time of birth.

Coronal sections through the anterior part of the glans at the seventh month show that the glans is, except at the region of the frenum, completely separated from the superficial fascia by a band of stratified epithelium. The periphery of this epithelial band is formed by a single layer of columnar cells with deeply-stained nuclei. As the center of the band is approached the cells become larger, of rounded or polygonal outline, and with more faintly-stained nuclei, while in some places they form

"nests" surrounded by flattened epithelium. In other parts of the band the cells in the center become somewhat flattened and do not stain well, and here and there we find cavities or clefts containing desquamated flat cells. The largest of these cavities contains, in addition, a mass of deeply-stained coarse granular material.

Sections through the posterior part of the glans, cutting through the anterior extremities of the corpora cavernosa, show that the epithelial band does not extend so far around on the under surface; its horns, in conformity with the oblique course of the corona, stop short at a level dorsal to that of the urethra. The areas of cleavage are more frequent than in sections farther forward, and flattening of the cells of the central layers is much more marked. The cavities contain concentrically arranged squames, and have well-defined walls whose structure closely approximates that of the epidermis. In the greater frequency of these cavities and the better definition of their walls, is found evidence that the splitting up of the epithelial ingrowth takes place from behind forwards.

Defective development of the epithelial plug which invades the glans may occur and complete atresia result. More common is a moderate degree of stenosis of the meatus, the lower part of the orifice being occluded by a membranous septum. Deficiency in the closure of the urethral groove results in hypospadias. The deficiency is most frequently found at the anterior end of the penile urethra, glandular hypospadias. This coincides with the point of junction of the glandular urethra with the urethral groove, the part of the groove which is the last to close.

The prepuce is, in a large proportion of these cases, externally quite well formed (52.6 per cent.); but there is also a large number (42 per cent.) in which there is a deficiency in its ventral portion, in which cases the prepuce is said to be "hooded." If the prepuce be completely formed externally, the urethral defect is often not recognized until circumcision has been performed. In glandular hypospadias a dimple or a gutter is usually on the glans. Such a depression

points to a defect in the formation of the glandular urethra. Imperfect or defective closure of the lips of the penile urethral groove is rare. A rare result of defective closure of the groove is the formation of a urethral diverticulum. Error in closure may take the form of external abnormality, and is exemplified in the various forms of malformation or deviation of the raphé. These are comparatively common. A second abnormality, very rare, arises from an epithelial "rest" in the line of closure. In one case the "rest" developed into a tubular cyst on the under surface of the penis.

The complete development of the prepuce, if by this is meant not only its external conformation but also the separation of its mucous layer from the epithelium of the glans, does not, as a rule, take place till some time after birth. If an attempt be made to retract the prepuce before this separation is complete it is found that "adhesions" require to be broken down. In the most extreme degree of this defect the movable prepuce is absent, and the skin of the penis is continued forward over the glans and joins the urethral epithelium at the meatus.

External conformation defect affords the "hooded" prepuce which accompanies the higher degrees of hypospadias, and which is also found in a considerable percentage of cases of glandular hypospadias. In the prepuce which presents this malformation there is not only the ventral deficiency, but also, as a rule, more marked differentiation than usual of the lateral and dorsal portions of the prepuce from the glans.

The raphé may deviate from its normal form and course, or cyst-formation may take place, or the two conditions may coexist. In this region, however, there is a second potential origin for cysts: the epithelial ingrowth which is concerned with the origin of the preputial fold.

Adhesions Between Prepuce and Glans. A certain degree of union of the prepuce with the glans may be looked upon as the rule at birth and for some time afterwards; it is the exception to meet with cases where

in young infants the prepuce is freely retractable. The degree of union varies. In some cases, when the prepuce is pulled back, the glans and mucous surface of the prepuce are found to be thinly coated with a material resembling lard; in others the union is so complete in parts that when it is broken down bleeding occurs. There is usually no union in the immediate vicinity of the meatus, and in circumcising infants and young children, it is not an uncommon experience to find that when the mucous layer is stripped back from the glans, the surface of the latter is, with the exception of the circum-meatal area and the sulcus behind the corona, quite raw. This raw surface often requires dressing for several weeks before it assumes the appearance of normal epithelium. In some cases, indeed, it cicatrizes, and remains for a considerable time at a lower level than that of the circum-meatal area. In the sulcus behind the corona separation has usually taken place by the accumulation of smegma, and this bears out the opinion already expressed when considering the microscopic appearance, that the splitting up of the epithelial ingrowth takes place from behind forward.

Atypical closure of the urethral groove, found in several cases, represents a condition where the urethral groove had closed normally, except at or near its anterior end, where, just behind the prepuce, there had been a deficient growth of mesoderm. The result was that the floor of the urethra was in contact with the epidermis, and ballooned out with urine during the act of micturition. The glandular portion of the urethra had been completely formed, but the meatus was smaller than normal. The particulars are as follows:

The first case was abortive hypospadias, bent penis, and malformed raphé; the glandular urethra was complete; at the seat of the deficiency, there was a pseudo-cyst which afterwards ruptured. The patient, a 2-year-old boy, had difficulty in micturition. Examination showed phimosis and ventral curving of the penis. An anesthetic was administered, and while this was being done he micturated. On turning up the bent penis a prominent clear cyst-like structure was found

in the middle line, a little behind the preputial orifice. The "cyst" which collapsed on being handled, lay under one limb of a much malformed raphé, and was firmly anchored to the deeper parts, so that when the skin of the penis was pushed forwards it overlapped the cystic swelling. The raphé of the perineum was widespread, enclosing a lenticular area of irregular skin. On the anterior surface of the scrotum it was double, and ultimately bifurcated. The right limb of the bifurcation was very prominent, and passed on to the right side of the penis beyond the root, and again subdivided into right and left. The right branch passed forwards and outwards and terminated on the dorsum of the prepuce; the left passed forwards and inwards to the middle line and terminated in the cyst. The left limb of the original bifurcation was faintly marked, and ran forwards in a straight line to the "cyst" where it was continued forward to the preputial orifice after giving off a branch to the left. This last branch ran on to the dorsum of the prepuce, where it terminated opposite to the branch from the right limb at a spot distal to the level of the corona glandis. On dilating and retracting the prepuce a tiny meatus was found on the under surface and near the tip of the glans. A probe could be passed along the urethra for a distance of a quarter of an inch (0.6 cm.) at which point it came to a dead stop. No trace of any orifice was visible.

The prepuce was divided longitudinally on its dorsal aspect, and the cut edges of the skin were sutured to those of the mucous layer. Ten days later he was again anesthetized, more thoroughly to examine the parts. There was some obstruction of the meatus by dried discharge. During his struggles while going under the anesthetic he passed urine through a fine orifice in front of the center of the "cyst" and then urine came also through the meatus, the two jets of urine being expelled simultaneously. A probe passed into the meatus came to a stop as before; another, introduced into the opening in the "cyst" and passed forwards, emerged at the ventral part of the meatus. It was then found that a probe passed into the meatus and well towards the floor

easily entered the urethra, and could be seen shining through the translucent wall of the cyst. If the probe were passed straight into the meatus it evidently entered a lacuna. The chief points of interest in this case are the malformation of the raphé, the complete development of the glandular urethra, and the pseudocyst.

The remaining three cases are examples of cysts of the ventral surface of the prepuce.

Case II was an incomplete cystic formation, resembling ulcer. A 17-year-old boy noticed a small "blister" on the under surface of the penis, a little way behind the frenum. The blister had ruptured, and had since continued to discharge for five years when Edington saw him. Situated on the raphé, about half an inch (1.25 cm.) posterior to the frenum, was a small elevation with sloping sides, which terminated in a central crater. The condition resembled, and was looked on as a slightly depressed ulcer. No discharge could be squeezed from the crater, and there was nothing suggesting a cyst. The raphé was otherwise well-formed, but deviated to the right about the middle of the penis, coming back to the middle line again as it approached the frenum.

After injection of the region with cocain, an elliptical piece of skin containing the "ulcer" was snipped away with curved scissors, and the edges of the wound were closed with catgut suture.

Occupying the raphé is a depression, 0.2 cm. in diameter, surrounded by a raised margin. Sections cut transversely to the long axis of the raphé show that the supposed ulcer is really a recess lined by skin, and overhung by one margin of external opening. The lining consists of stratified epithelium, which differs from that of the prepuce as follows: It is more bulky; the deepest (basal) cells are not so regularly arranged; interpapillary processes occur on only one side of the recess, and are ill-formed; there is an absence of the stratum granulosum, and the protoplasm of the superficial layers in the deeper part of the recess is unstained, so that the nuclei lie in the meshes of a deeply-stained network.

Case III was one of a cyst in median line. A 2-year-old boy, the subject of slight phimosis and of hydrocele, presented a cyst on the under surface of the prepuce immediately in the line of the raphé. The cyst was opaque, yellow, not much larger than the head of an ordinary pin, and resembled one of the multiple sebaceous cysts which are not infrequently seen on the scrotum and penis.

In the hardened specimen the raphé is not recognizable further forward than a point 3 mm. behind a small cyst-like structure, which has a diameter of slightly over 1.5 mm. Sections cut transversely to the long axis of the raphé show a cyst whose wall is composed of fibrous tissue lined by stratified, considerably flattened epithelial cells. In the most superficial part of the cyst the epithelium comes into direct contact and apparently blends with epidermis. As the point where this blending takes place is approached, the cells of the most external layers of the cyst-wall are observed to have become much bulkier, approximating in appearance the deeper layers of epidermis, and at the spot where the cyst-wall is blended with the epidermis the bulky cells of the former form a continuous layer, which separates the flatter cells of the cyst-wall from the equally flat epidermal layers. At this point the epidermal surface of the prepuce is slightly umbilicated.

Case IV was one of a 17-month-old boy with mucous cyst, who was seen on account of a phimosis. There was some deviation of the raphé. On pulling the foreskin back as far as possible a cyst was seen under the raphé, which here was situated well to the left of the middle line. The cyst was translucent and was situated near the anterior end of the external layer of the prepuce. It appeared at first to be double, but was not really so, pressure causing the contents of one swelling to pass into the other. After removing the prepuce by circumcision the cyst was punctured, and some clear mucous fluid escaped. No exact measurements of the cyst were taken, but it was of elongated shape and lay under and in line of the raphé. It seemed to consist of more than one chamber, as it did not collapse after

being punctured. An interrupted series of sections was cut from before backwards transversely to the long axis of the raphé. From this series it was possible to reconstruct the outline of the cyst. The cyst-cavity was single in front; but passing backwards it divided into two by a septum which passed obliquely from the right ventral to the left dorsal part of the cyst-wall. The anterior free edge of the septum was crescentic, and concave forwards, as was shown by its upper and lower extremities appearing in sections farther anteriorly in the series than those which contain the complete septum. Further backwards the septum was shifted more and more to the left, the left loculus became smaller and finally disappeared, and there was again a single cavity. Still further back another septum separated a small loculus on the right. Thus a main cyst was joined on the left side by a loculus which opened forward, and further back a smaller loculus joined the main cavity on the right. Microscopic structure of the cyst-wall differed from that in cases II and III. There was nowhere any continuity with the epidermis. The fibrous outer wall was composed of closely set connective tissue with elongated nuclei which here and there suggested those of muscle-cells. This was lined by epithelium, as a rule in two layers, but increased in some parts to four or five. The inner cells were long and cubical or globular, and the clear body of the cell projected well beyond the nucleus. External to the connective tissue of the wall was the lower subcutaneous tissue, containing many blood-vessels. The cavity of the cyst contained fine granular material resembling precipitated mucus. The epithelium lining the cyst was comparable to that of the urethra in the 7-month-fetus; but in the latter the inner layer is distinctly columnar, and there are numerous shed cells in the urethral lumen.

Case I was an example of defective growth of the mesoderm; and the fixation of the cyst-like structure on the deeper parts was the feature which first led to a true appreciation of its nature.

The remaining cases (II, III and IV) form a series in which the different results of error (formation of

epithelial "rest") in the closure of the urethral groove are exemplified. Case II may be looked on as the simplest form. In it is an example of a skin-lined recess, the opening of which may have been at one time completely closed by epithelium, or have been temporarily occluded by a plug of desquamated cells from the interior of its cavity. Whatever the primary condition, distension of the cavity had occurred, and was followed by rupture and discharge of the contents. In Case III the cyst was completely closed, and both in its epithelial lining and the nature of its contents, presented characters similar to those of an "implantation" cyst. It is possible that the difference (flattening) between its epithelium and that of Case II depended on the fact that in the latter all tension was absent, and had been so for a considerable time. Case IV differs from both of the preceding in the shape of its cavity, and in the character of its epithelium and contents. Its epithelium tends towards the urethral rather than to the epidermal type, and despite its superficial situation when first noticed it has probably arisen from the deeper cells of the inner genital folds, *i. e.*, cells which would ultimately assume the characters of urethral epithelium. It approximates the specimen described by Thole in which a moniliform cyst showed on section flattened cells on its floor and columnar on its roof.

One thing is common to all three cases—their situation in the region of the raphé. When the situation and structure of these cysts are taken into consideration along with the embryology of the parts, their dependence on faulty closure of the urethral groove must be recognized.

The Urethra and Prostate Gland.

THE URETHRA.

Air Embolism in Air-Inflation Urethroscopy. A case is reported by E. G. Mark [9] who cites a case from Fen-

(9) Jour. Amer. Med. Assoc., Feb. 11, 1911.

wick of emphysematous infiltration. The patient had profuse bleeding from attempts at catheterization before Fenwick saw him. The false passage lay just below the pin-point orifice of the strictured urethra, seemingly a bloody-edged ragged slip. The patient called out that something was running down his thighs. Air was passing freely through the opening of the "false passage" and escaping into the tissues of the perineum. There was no doubt but that the false passage was very extensive. No ill results ensued, but it is easily conceivable that damage of a grave description can be inflicted by unfiltered air passing over an inflamed surface and opening up extensive cellular planes in the thighs, perineum and pelvis.

Within the past year, while opening up infected follicles in the anterior urethra, Mark observed 2 cases in which localized emphysema in the cellular tissue of the pendulous urethra occurred as a result of the air-inflation used during the operation. In neither of these cases was the local condition marked, nor were there any generalized symptoms. In both cases the emphysematous condition gradually disappeared within a few days without giving rise to any untoward symptoms.

In the following case which forms the basis of this report, the emphysema was so extensive, and immediate symptoms so alarming in character, that a fatal issue seemed unavoidable. The possibility of similar complications arising in other cases of a like character has led Mark to the belief that extreme caution should be used in all intra-urethral or intravesical operations performed under air-inflation.

A 35-year-old man had intermittent urethritis for 15 years. He was first seen Oct. 13, 1910. On examination typical chronic urethritis of the antero-posterior type was found. Urethroscopy disclosed diffuse infiltration, a few infected urethral follicles tending to become cystic, and a band-like stricture on the floor of the urethra just anterior to the penoscrotal junction. After preliminary treatment, the air-inflation urethroscope was introduced October 12. Preparations were made

for dividing the stricture through the urethroscope. The strictured area was cocainized by the application of a 2 per cent. solution, and after a few minutes the urethra was inflated with air and the stricture divided. An emphysematous condition of the cellular tissue in the neighborhood of the stricture was noted and almost immediately the patient complained of pains in the epigastrium and began to cough. He became rapidly cyanotic and the radial pulse became imperceptible. Auscultation over the cardiac area revealed the "whirr" of what was considered as apparently quantities of air passing through the heart. The heart-sound rapidly became feeble and then could not be detected. Respiration quickly ceased, not suddenly but progressively, as in the dying. The pupils were fully dilated and the eyes were fixed; in fact, the whole appearance of the patient was that of a cadaver. Artificial respiration was employed and whisky administered hypodermically. Within a short time feeble signs of returning life were noticed and the patient gradually recovered consciousness, though some air could still be heard whirring through the heart. The patient still complained of a feeling of oppression in the epigastrium and this feeling was noticeable in a gradually diminishing degree for a period of about one week. The local emphysema seemed to involve only the cellular tissue of the pendulous urethra. There was no emphysema of the scrotal tissues. On the following day the patient complained of tenderness in the hypogastrium, especially marked on the left side. Examination revealed a fairly extensive emphysema of the abdominal wall, which slowly disappeared, in about one week. No other symptoms of an untoward nature were noted.

There can be no question but that the causative factor of the serious symptoms in this case was air-embolus. It is, however, astonishing what an amount of air was forced into the circulation without a fatal issue. This case cannot be regarded as merely an "accident" occurring during operative urethroscopy under air-inflation.

Stricture Symptom. A peculiar, indescribable sensation in the urethra which may be likened to a creeping, crawling feeling, accompanied by a slight twinge, is almost always due to stricture.[1]

Urethritis of Chemical Origin. W. J. Robinson[2] concludes as follows: 1. Urethritis of chemical origin is more common than is generally supposed. 2. While most cases are caused from self-administered injections prescribed by barbers, friends, and others, some cases owe their origin to the over zealousness of physicians. 3. The unscientific and unjustifiable silver nitrate test, which should be forever discarded, has been responsible for very many cases of chemical urethritis. 4. The diagnosis of chemical urethritis is made by the history of the case, the freedom of discharge from gonococci, and generally its improvement on being let alone. 5. One of the most useful agents in the treatment of chemical urethritis is warm sterilized olive or almond oil, or ½ to 1 per cent. solution of some organic iodin derivative (iodoform, dithymoliodid, isobutylorthocresoliodid) in one of the above oils. Tendency to stricture should be prevented by dilators or by sounds dipped in the solutions.

THE PROSTATE.

Prostatism. According to V. Pedersen[3] there is a period in prostatic disease which is being more definitely recognized than previously, which rests on the condition of the bladder mucous membrane due to the disease. If the mucosa be in good condition and the prostate gland has begun to obstruct, the best time for operation is at hand. Delay until the mucosa is greatly injured means hazard and likelihood that the injury will be permanent and beyond repair. When the mucosa of the bladder has begun to suffer, it is often because the obstruction by the prostate gland and the cystitis have reached a degree which soon leads to serious results upon the kidneys and ureters above.

The mere removal of an enlarged and obstructing

(1) Amer. Jour. Derm., July, 1911.
(2) Med. Record, Apr. 8, 1911.
(3) N. Y. Med. Jour., July 29, 1911.

prostate gland may be mechanically possible and performed without death, but if a bladder is left behind so badly damaged from chronic cystitis as to render functional restoration impossible and as to leave the symptoms proceeding from the bladder virtually unchanged, then the operation has failed of its ideal success. If the prostate gland is merely enlarged, obstructs none or very little, and the bladder is in good condition, operation is not justifiable. If the bladder be greatly changed from inflammation beyond recovery, and if the catheter may be successfully passed, in most cases office irrigation is preferable and more conservative than operation. Such a bladder is a contraindication to operation.

Prostatitis and Seminal Vesiculitis. Chronic gonorrheal infection of the prostate and seminal vesicles [4] is of frequent recurrence. The symptoms may be slight; there often is an increased frequency of urination; there may be a feeling of fullness or uncomfortableness in the perineal region; there may be a slight sticky, or muco-purulent exudate and the urethral drop, and the urine may be cloudy. On the other hand, the urine is not always cloudy with this subacute or chronic prostatitis.

It is rare to find gonococci in the prostatic exudate a year after the original infection, but it does occur. Before a year the gonococci may be found frequently when there is no evidence of previous gonorrheal infection. When from massage of the prostate and stripping of the seminal vesicles the examination of the slide from the drops of secretion exuded from the urethra show gonococci, of course the diagnosis is positive. If such an examination shows no gonococci in a suspected individual, it has been suggested that from 1 to 2 c.c. (5 to 10 minims) of a 1 per cent. solution of silver nitrate be injected into the posterior urethra with the Ultzmann syringe. The stimulation from this injection will cause the next day an increased discharge, which should cause gonococci to be found on microscopic examination, if they are still present.

(4) Jour. Amer. Med. Assoc., Oct. 29, 1910.

Besides the local symptoms of chronic prostatitis, patients suffering from this condition often have neurasthenia and hypochondriasis. Men otherwise well, with no apparent cause for symptoms of nerve fatigue, should be carefully questioned as to previous gonorrheal infection, and the prostate and any secretion that can be expressed from it should be carefully examined, even if the local symptoms are negative.

Too great care cannot be taken in determining that a patient who has had gonorrhea is free from gonococci and is cured of chronic inflammation before he is dismissed from treatment. This means not only frequent examinations by the microscope of slides prepared from actual urethral discharge, but also any discharge that may be expressed from the prostate and seminal vesicles, and until such examinations are negative the patient should never be discharged. Lest he stop treatment before he is cured, he should be thoroughly cautioned in the beginning of his treatment of the persistency of this particular germ and the absolute necessity for a complete cure, for his own and his family's future.

Acute gonorrheal inflammation of the posterior urethra is, of course, readily diagnosed by the cloudiness of the urine. A later involvement of the prostate or seminal vesicles is diagnosed by passing the finger well up the rectum and noting the enlargement and tenderness of the prostrate; and, if the seminal vesicles are involved by noting their fullness and tenderness. Normal seminal vesicles are hardly palpable.

Acute inflammation of the prostate and vesicles should be treated with rest, a diet of milk and simple cereals. Plenty of water should be taken, and hot sitz baths once or twice a day. The urine should at first be rendered alkaline with potassium citrate during the stage of acute irritation, and later hexamethylenamin or salol (phenyl salicylate) should be administered. There should generally be no urethral injections and no manipulation of the prostate, and certainly no passing of instruments into the urethra. If the prostatitis becomes localized and causes an abscess, of course the treatment is surgical interference.

In subacute prostatitis the prostate should be gently massaged, and some of the exuded fluid which is received on a glass slide should be examined under the microscope for pus and gonococci. Generally, there will also be found living spermatazoa and often dead spermatozoa, with prostate epithelial cells, and perhaps crystals of spermin. The tenderness of the prostate determines the frequency and the amount of massage that it should receive; perhaps it should be given every second day for a short time, and then twice a week. At each massage the seminal vesicles should be thoroughly stripped. During this subacute inflammation all violent exercise must be prohibited; alcohol should certainly not be allowed, and the patient is usually better without tobacco than with it. Tea and coffee, if allowed, at all, should be in small amount. Constipation should never be allowed in any prostatitis. It is always best to wear suspensory bandage during acute gonorrhea, and during acute and subacute inflammation of the prostate.

The prognosis is good if the patient will give himself the proper rest in the acute condition, if he will take care of himself in the subacute condition, and will persist long enough in his treatment of the chronic condition.

If gonococci are present in this secretion in subacute or chronic inflammation, vesical injections of weak silver solutions, such as from 1 to 500 to 1 to 1,000 of one of the albuminate silver preparations, should be given daily or every other day, and at least every other day or generally every day the prostate should be massaged while the solution is in the bladder. The patient then urinates and thus washes out the bladder. These bladder washings should soon be repeated less frequently, and as soon as the gonococci are found absent from the prostatic secretion, the bladder injections should be given very infrequently. A microscopic test should be made once a week for three or four times, and then again in a month. The gonococci remaining absent, the patient may be considered cured of the infection. The old assertion that when the gonococci had

infected the prostatic vesicles the patient could never be cured, but harbored them for the rest of his life, is probably not now true if the affected individual will allow himself to be treated properly before the germs have found a more permanent harbor deeper within the glandular tissue.

In chronic prostatitis without gonococci, or after the gonococci have disappeared, besides massage of the prostate once or twice a week, local applications can be made by high injection of from 1 to 2 c.c. (5 to 10 minims) of various silver solutions, the strength of which should vary from 1 to 3 per cent. Instillations should not be used more frequently than once in five days. Ichthyol solutions have also been used for this purpose. The cold sound is occasionally of as much advantage in the posterior urethra as it is in gleety conditions of the anterior urethra. Not infrequently the double closed catheter, which allows the circulation of cold water, is one of the best tonic treatments of the posterior urethra and prostate. Such treatment is indicated only in the chronic form of the inflammation when the prostate has not returned to its normal size, tone and feel. A patient who has become neurasthenic and mentally disturbed, and perhaps below par physically, should receive tonic treatment and such a vacation as he may be able to take, and the local inflammation will often rapidly improve when it has not improved under more active medication. It should be urged that after the gonococci have disappeared, too long use of instruments should be discouraged.

Prostatectomy. B. Tenny[5] remarks that anatomically almost all hypertrophies of the prostate are in part at least intravesical. There is probably no hypertrophied prostate which cannot be removed through a perineal incision, but no large one can be dragged out through the urethra without injury to the ejaculatory ducts or sphincter unless in small pieces, and the same must be in less degree true of the transcapsular operation. If 20 per cent. of hypertrophied prostates are in some degree cancerous, the objection to morcellation is

(5) Boston Med. and Surg. Jour., Jan. 26, 1911.

evident. If the wound is left entirely open, or a large tube is left from the bladder to the dressing, an ideal drainage is provided, but the importance of this may be over-estimated. Recovery from operations through the perineum has been a little better than from the suprapubic operation, but there is a much greater difference in mortality reported among men doing the same operation than there is between the gross statistics of the two operations, and these gross statistics are coming nearer together each year. It is generally admitted that the late results of the suprapubic operation are more satisfactory. The reported higher mortality of the suprapubic operation is really the only argument against its adoption as the general rule, with the perineal operation for occasional use. The preference of men already experienced in other perineal operating for perineal prostatectomy, may partly account for a difference in results. In urethral perineal prostatectomy the separation is downward, the finger is hooked over the top, and the masses are dragged out. The same result is accomplished by the retractor and traction forceps in the transcapsular operation. In doing a suprapubic enucleation the natural movement is to use the same hooked finger before the prostate has been fully separated from its upper attachments all around. Doing this, one is likely to peel up a strip of the bladder wall itself and open into the rich plexus of veins. A suprapubic enucleation should be done with a straight finger until the hypertrophied gland is entirely separated from all its lateral attachments.

An Analysis of 542 Cases of Prostatectomy. E. S. Judd analyzes 542 cases of prostatectomy. Prostate hypertrophy occurred twice as frequently in men living in the country as in those living in the city. Only a small percentage of them had ever had specific infection. The greater number of these patients were operated on between the ages of 60 and 70 years. In the series of 542 cases, 11 were under 45 years, 105 were from 50 to 60 years, 268 were from 60 to 70 years, 131 were from 70 to 80 years, 15 were over 80, and the ages of the remaining 12 were unknown; 417 were married, 94 were widowers and 19 were single.

The average duration of symptoms before the patient came for operation was 5.96 years. Although patients were not chosen because they were good risks for operation, and although many patients have been operated on many times who had lesions of vital organs, an endeavor was made to operate only on patients whose specific symptoms were dependent on prostate enlargement. In the experience of the Mayo's it has not always been easy to determine this point.

The primary symptoms of mechanical obstruction at the neck of the bladder are frequency of urination, burning, pain and tenesmus. The secondary symptoms are loss of appetite, insomnia, loss of strength and weight. These secondary symptoms may be caused by damming back in the ureters and pressure in the kidneys, or they may be caused by intoxication from the presence of residual urine. The symptoms are identically the same and are probably caused by the same factors which produce symptoms in patients having insufficient kidney elimination. It is then very important to determine whether the patient is suffering from renal insufficiency alone, or whether he is suffering from autointoxication resulting from absorption and interference with kidney function, which interference is caused primarily by mechanical obstruction of the enlarged prostate. It is not unusual in routine examinations to discover a very decidedly enlarged prostate which is not producing obstruction to the urinary flow. If a catheter be introduced into the bladder and but a slight amount of residual urine be found in a case having marked secondary symptoms without great difficulty in voiding, little or no benefit results from a prostatectomy, no matter how great the tumor. Moreover, in such a case, operation is a great risk. On the other hand, if a great quantity of residual urine is obtained with the catheter (and atony is excluded), the case is one for prostatectomy, even though the tumor be small.

During the past few years the Mayo's have not only been able to reduce mortality materially, but have secured a more satisfactory convalescence and better results by spending a little more time in preparing

these patients for operation. With a permanent catheter in the urethra or through a suprapubic stab wound, the patient is in the same condition, so far as emptying the bladder is concerned, as he will be after the prostate is removed. This will enable the patient to eat, drink, sleep and improve generally in health. These patients drink very small quantities of fluids in order to diminish the amount of urine, as a great deal of suffering is caused in voiding. Their arteries are hard and inelastic, and if the condition is allowed to prevail it will be difficult to fill up the circulation; therefore, the patient is encouraged to take a great quantity of fluid for several days, which fills the circulation and throws the kidneys into marked activity.

In almost every instance in which there was any quantity of residual urine, by the introduction of a permanent catheter the specific gravity became much lower within a few days. Frequently it changes from 1,020 to 1,008 or 1,009 within a short time. An operation should not be performed until this reaction has taken place and the specific gravity has risen, which may occur in from one to several weeks. Thus the effect of the prostatic enlargement is overcome before the cause is removed.

In determining whether or not to operate for enlargement of the prostate consider first the specific symptoms dependent on the enlargement from which the patient is suffering at the time. These symptoms may be tabulated as follows:

1. There may be from 3 to 15 ounces of residual urine, and the patient not using a catheter.
2. Extreme over-distension and dribbling.
3. Retention from time to time.
4. Ability to void some urine, although the patient is obliged to employ a catheter to obtain rest and comfort.
5. Entire dependence on catheter.
6. Complete retention.

As a rule it is not advisable to operate if there be only two to three ounces of residual urine and only slight symptoms. This condition may exist for years without becoming worse.

One-fifth of the patients who presented themselves for operation were using a catheter either all of the time or occasionally. Nearly four-fifths of them had used a catheter at some time during their trouble. Eighty-one (15 per cent.) in the series had had a recent acute retention.

The cystoscope was not often used in prostatic cases as a means of diagnosis when it was first introduced. Within the past five years, however, we have employed it in over 95 per cent. of our cases and have found it of the greatest value in differentiating between tumors, cystitis, diverticulæ, in determining the presence of stones, and in selecting the type of operation for a given case.

The perineal operation is the one ordinarily chosen because usually, a shorter and easier convalescence follows this method. But if the cystoscope shows a stone of any size in the bladder, if the median and lateral lobes are enlarged so as to make an intravesical tumor, or we are not able to reach the upper border of the gland with a finger in the rectum, suprapubic operation is done.

The mortality in these cases is not affected by the type of operation. The suprapubic sinus, as a rule, requires a longer time to close, although the control is absolute from the time the urine is first voided through the urethra. The suprapubic operation is less likely to be attended with the painful complication of inflammation in the epididymis or testicle. The rectum has not been injured in any of the operations for benign lesions.

Of 532 cases, 323 were perineal operations for benign hypertrophy; 25 of these had stones in the bladder also. Fifty of the series were perineal operations for carinomata. One hundred and forty benign cases were done by the suprapubic route; 41 of these were associated with stones. Nineteen carcinomata were removed by the suprapubic route; 2 of these cases had stones in the bladder. Stones were present in 12.7 per cent. of the cases.

Closure of the urethral orifice is cared for in the first place by the smooth sphincter internus muscle

where congestion is a marked feature and where irritable nerves require soothing. But for large, hard prostates a more stimulating treatment is indicated. For this purpose a vacuum electrode may be used, or, better still, a condenser electrode so modified that all the electric bombardment is in the region of the prostate.

His most successful cases have been those where congestion and irritation rather than size of prostate have been the prominent features. A medical man, aged 59 years, had been waking almost every hour of the night and rising several times to pass urine. This condition had been gradually getting worse for several years and he had tried medicinal treatment without avail. But though the symptoms were so disturbing the enlargement of the prostate was not great. He was treated three times a week for five or six weeks, using the solid metal electrode, and could then sleep the whole night through without disturbance. The cure was perfect and lasting.

A very similar case was that of a man, aged 60 years, who had to be relieved with a catheter three years ago and had been troubled with disturbed nights ever since. rising five or six times to pass urine. After seven treatments he was able to go through the night with only one disturbance. A marked feature in this case, as in so many others, was that he had to wait for his urine to come. After a few seconds it would begin to dribble and a little later it would come in a fair stream. This condition is amenable to high-frequency current treatment.

Another patient of about the same age was troubled with the opposite condition. After a cup of tea or dram of whisky the desire to pass urine would be so urgent that if he could not obtain immediate relief he would sometimes find himself wet to the boots. There was no marked enlargement of the prostate, and the trouble was not due to retention. His urine was clear, faintly acid, of specific gravity 1,022, and contained neither albumin nor sugar. The condition was greatly improved by the treatment. The patient was, however,

advised to abstain from whisky in future, and to be very moderate in the use of tea and coffee.

Many patients had been made worse by the well-intentioned advice of surgeons whom they have consulted. An elderly man with symptoms of enlarged prostate is warned of his danger and advised to keep a catheter and antiseptics for any emergency. He is also told never to delay when he has a desire to micturate, but carefully to avoid holding his urine too long. The fear of a stoppage is always before his mind, and he urinates doubly as often as he need. In time the act becomes a habit and his bladder expects to be emptied frequently by night as well as by day. This faulty habit cannot be overcome without assistance. High-frequency treatment will remedy the cause and restore the confidence. A patient of this sort was 73 years of age. He was troubled with frequency of micturition, especially in the daytime. There was also delay in starting the stream, and sometimes dribbling after passing it. He consulted a surgeon, who drew off more than a pint of urine, and advised him to have his large prostate removed. A physician reported unfavorably on his heart, and fearing operation, he decided upon electrical treatment. The result was eminently satisfactory. There was improvement in all the symptoms and in the health of the patient. The prostate was reduced in size.

In another case the patient was 70 years of age, and symptoms of enlarged prostate had been gradually getting worse for eight or ten years, but he had never had stoppage. The prostate was of moderate size, but he had much pain and discomfort in the region of the bladder and urethra, and rose eight or ten times a night to pass urine. After three or four weeks' treatment the pain left him, but the nights were just as disturbed. It was only after two months' treatment that he obtained good nights. Ten months after continuous treatment the congestion in the blood-vessels and stasis in the tissues were relieved.

By this treatment the nerves are soothed. The intense irritability of the bladder which is such a marked

feature of the disease passes away. The tone of the bladder muscles is improved, and as a consequence the size of the stream is increased and also the force of propulsion. The bladder becomes able to empty itself, and the urine returns to normal. The restoration of the confidence of the patient is no small help in lessening the frequency of micturition.

Is the prostate reduced in size? In seeking an answer to this question the enlargement is not all due to overgrowth. Much of it is due to congestion. So there may be very considerable reduction in size without contending that high-frequency currents will remove fibrous overgrowth. It is important also to bear in mind that the prostate is often enlarged for years before it causes any trouble. The symptoms show themselves only when the vital powers begin to flag owing to advancing age. It is only natural, therefore, that high-frequency currents, by renewing to some extent the healthy vigor, will remove the symptoms of obstruction. But besides all this, probably no one who has watched carefully the course of treatment of a successful case will fail to be convinced that there has been considerable reduction in the actual size of the prostate.

Electricity in Genito-Urinary Practice. While W. B. Snow[7] states general recognition of the value of the high potential electrical currents, *i. e.*, currents of high voltage—the static and high-frequency currents—in the treatment of inflammation, must await education of the profession, results are uniformily successful in most cases in the hands of those who understand the method. There are four important effects produced by these currents, upon which the benefits derived from their employment depend: (1) Tissue drainage; (2) hyperemia; (3) relaxation of muscular spasm; and (4) certain antiseptic effects.

1. In infiltration not associated with infection, and in conditions when the infection is of a character which produces a minimum of tissue destruction, which involves only the lining of the tubules of the gland of

(7) Amer. Jour. Derm., June, 1911.

an organ, which is provided with a canal for the discharge of its secretions, there will be no danger of extending the infection. It is so in gonorrheal infection of the vesicles, prostate, and epididymis. These parts are therefore treated to reduce the induration even when gonorrheal infection is present, by the same method as is employed in other cases of prostatic hypertrophy. When, however, the infection is tuberculous or pyogenic in character, the method employing the Roentgen ray and hyperemia is indicated.

The *modus operandi* of producing tissue drainage for the removal of induration, is the induction of diffuse cellular contraction throughout the mass of any structure or part so involved. With periodic contractions, alternating with periods of rest, the infiltrating materials are expelled from the intercellular spaces and on through the lymphatic channels, so draining the tissues, leaving the parts soft with the pressure removed. This accomplished, there is prompt resumption of circulation and metabolism throughout the structures of the gland which had been the seat of local stasis. This briefly explains the principle of tissue drainage by the electrical currents, and the same is true of any indurated or infiltrated tissue which is accessible. The only electrical currents, however, that produce this effect in an efficient and practical manner are the static currents. The high potential or voltage and diffusion of the static currents as well as the unipolar characteristics and small ampèrage, which are unique qualities of these currents, make the results from their employment remarkably effective. It must never be presumed or anticipated that the constant (galvanic) or induced (faradic) current of low voltage or the high-frequency currents which produce no tissue contraction can effectually produce effects.

2. Muscular spasm, present whenever active inflammation is in process, is practically relaxed by the same methods and currents as produce tissue drainage. That muscular spasm, which is caused in inflammatory processes should be allowed to persist is contrary to reason. No inflammatory condition can be promptly

relieved while muscular spasm persists. Such methods violate what has been considered Nature's method of putting an inflammatory process at rest. If natural processes can overcome an accumulated inflammatory induration, such rest would be unnecessary. Spasm in connection with inflammation as it occurs, is the reflex effect of the inflammatory process and should be looked upon as an impediment to cure, as stasis is. It is gradually dawning upon the profession, that rest instead of being a part of the process of the *vis medicatrix naturæ*, interferes with the restorative process. So the inflammatory process, as present, with various pelvic congestions, leads on to spasm of near-by structures such as the muscles through which the spermatic cord passes, causing a venous obstruction and consequent varicocele which promptly disappears on the relief of the inflammatory process which permits the muscular spasm to relax.

3. Hyperemia as a therapeutic means has received considerable attention of late, but little has been said of the *modus operandi* of its action. It has been employed from the earliest times in the form of setons, synapisms, blisters, cups and by various methods of using heat and cold, and has been generally used from the point of view of a derivative or counter-irritant; whereas the effect seems to have been always due to the three-fold effects of increasing the blood-supply in a diseased part: (1) increased metabolism or tissue change with the increased circulation of fresh arterial blood through the part with (2) coincidently increased nutrition and (3) increased phagocytosis, all of which serve a valuable part in the treatment of localized infection.

The methods of producing hyperemia with electricity are by the employment of superficial irritation and the passage of an electrical current of sufficient ampèrage through the tissues; and they are the most practical and efficient of all methods. Local heat is produced by passing the bipolar, direct d'Arsonval current through the tissues. In the parts so heated, the blood is caused to circulate freely, dilation of the channels of circulation taking place in the tissues in response to the

vasomotor mechanism in the effort to prevent the tissues becoming over-heated. It is thus possible at the will of the operator to induce a localized hyperemia which affects the tissues as previously shown. It is always best for the purposes of inducing hyperemia to use a current which does not produce electrolysis, as the constant or galvanic current does. The high-frequency current produces heat without electrolysis, and consequently without injurious effects. The other method of producing hyperemia applicable in superficial inflammation is the direct application of a vacuum electrode connected with a high potential current source, either directly from a static machine or a high-frequency apparatus.

The method of producing deep hyperemia is by the employment of the bipolar, direct d'Arsonval current. A current of the adequate milliampèrage is passed directly through the tissues between the electrode, when, in the path of the current, hyperemia is produced in response to the induction of heat. This method is employed for the treatment of local infection, either tuberculous, pyogenic or gonorrheal. The increased blood-supply in the tissues, together with the effects of the heat upon the germs, facilitates their destruction by the phagocytes. Clinical experience verifies the hypothesis as to the activity of the phagocytes, by the disappearance of the infection; for under these conditions the germs disappear, which disappearance cannot be attributed to the action of the current upon the germs, as the current has little or no deleterious effect upon cell protoplasm.

The effects of vacuum-tube discharges upon germ life are demonstrated and explained by the character of the discharges produced at the surface of the glass, where nitrous oxids and ozone are produced, as well as the actinic action of the high-frequency discharges. This effect however, is limited to germs at or very near the surface of the skin or mucous membrane to which it is applied. In the superficial tissues, however, the discharges produce an intense hyperemia with an increased presence of phagocytes which presents an additional condition adverse to the infection.

These principles applied to the treatment of diseases of the genito-urinary tract, as elsewhere, are very effective. No class of local inflammation is more uniformly amenable to these methods of treatment than those of the genito-urinary tract. Prostatitis, either of the infected or non-infected type, is promptly cured in most cases by the local administrations of the static-wave current, which is applied to the patient lying on the side with the back towards the machine on a properly constructed chair or couch. The chair is placed on the insulated platform. An electrode is held firmly against the gland usually by the hand of the patient. The electrode is connected to the positive pole of the machine and the negative pole is grounded. The spark-gap is then regulated to control the current by gradually drawing apart the discharging rods. The best effects are obtained when the spark is discharging at the rate of 120 to 200 per minute. In this way the gland undergoes successive contraction and release in the intervals between the charge and discharge. The effect of the current so applied is gradually to soften the infiltrated gland by forcing out the accumulated infiltrating materials. The treatments are administered for twenty minutes during which time the spark-gap is gradually lengthened as the tenderness of the gland subsides. The spark-gap may be gradually lengthened to from four to five inches, and it will be rarely necessary to use a spark-gap longer than this in the course of the treatment of prostatitis. These treatments should be given daily until there is an indication of over-stimulation evidenced by sensitiveness, which may occur in from five to ten days. Then the treatments should be given on alternate days until the gland is reduced to normal. In cases of long-standing, this may take from two to three months; whereas, in the early cases many of them are entirely cured in from three to four weeks.

The certainty with which these results are obtained cannot be fully appreciated by those who are unfamiliar with the work; but the time has come when operative procedures on the prostatic gland should be rarely advised, as will be the case so soon as the certainty of this

method is recognized. Snow finds it indicated in all cases except those affected by fibroma, malignancy, or tuberculosis. Undoubtedly conditions of congestion in the veru montanum are promptly relieved also, as in cases of impotency a very prompt recovery takes place usually during the first days of treatment, except in the aged.

In the infectious cases of prostatitis there is usually an associated vesiculitis and the microscopic evidences of infection. Under the combined treatment employing the static-wave current and the bipolar, direct d'Arsonval method, these cases are promptly relieved. The bipolar method is applied with a glass vacuum-electrode placed against the vesicles and prostate, and held in position by the ordinary *x*-ray tube-holder, and the other pole connected with a small metal plate placed just above the pubis. This current should be administered with a current strength which produces perceptible heat in the tissues, and continued for ten or fifteen minutes. The static-wave current should then be administered for twenty minutes. This method not only relieves the local troubles, but there will be a very prompt disappearance of a gonorrheal arthritis when present and occasioned by the local infection as is often the case.

There is abundance of clinical evidence, verified by microscopic examinations, to confirm the success of this method in gonorrheal vesiculitis.

In epididymitis the method employed which successfully relieves these cases from the first treatment and cures them within a week in all cases, is the application of the direct vacuum-tube current. This method is used, employing a vacuum electrode having a broad concave surface, which is held in contact with the part by the patient who with a towel in one hand, and the other hand upon the insulated handle, keeps the surface of the electrode in correct position against the part. The arrangement is made exactly the same as for the static-wave current, except that the vacuum electrode is substituted for one of metal. The application is made to the patient seated in the chair upon the platform, the length of the spark-gap regulating the intensity of the

current. As in the treatment of other conditions of inflammation, the spark-gap should be made as long as can well be tolerated at the outset and gradually lengthened as the pain diminishes and as the parts become softened. By this method, in fifteen minutes to half an hour, the parts will be rendered almost painless to manipulation, and the condition will progressively improve with each daily treatment until the condition is normal. Often cases that have been under treatment for weeks by other methods, are in this way promptly cured in a few days.

Varicocele not arising from a phlebitis, but from an obstruction in the return circulation, will in most cases be due to pressure obstructing the venous return where the spermatic cord and vessels pass through the external and internal abdominal rings. This happens because contraction of the muscles takes place in this region which is induced by some other inflammatory process in the pelvis. The indication in these cases is to relax the spasm of the muscles constricting the cord. This is accomplished by placing an electrode consisting of a piece of flexible sheet metal of approximately a thickness of 22 B. and S. gauge formed to fit the part, and held in position with a towel in the patient's hands. The wave current is then administered with as long a spark-gap as the patient will permit and continued for fifteen or twenty minutes until the spasm is considerably relieved. It may be necessary thoroughly to moisten the surface when the metal is held against the surface to prevent a sparking and consequent burning sensation due to the presence of the pubic hairs.

In early cases this will be all that is necessary except to relieve the prostatitis or other inflammation which may be the cause of the muscular tension; for the parts will promptly resume their normal condition when the pressure is relieved. In other cases the application of the direct vacuum-tube current as suggested in the treatment of epididymitis, following the other treatment, may successfully restore the parts to normal. In some cases, however, in which the veins have undergone structural changes or when due to obstructive causes, it will be impossible to succeed in restoring the veins to normal by either the single or combined method.

Spasm at the neck of the bladder will often be relieved by the method employed in the treatment of prostatitis. In some cases, however, it will be necessary in addition, to employ the wave current with a metal sound as an electrode placed in the urethra and in others to remove papillomata, fissures, ulcers or other conditions within the bladder which are sources of irritation, which cause the vesical spasm.

The ordinary metallic sounds make excellent electrodes, requiring only connection to the machine by a small wire, one end of which is twisted around the outer end of the sound. The patient may hold the electrode in position with the fingers without leakage of the current, or feeling any sensation in the fingers, as the current takes the track of least resistance through the mucous membrane. Nor should any consideration be given to the leakage of current in these cases; for, as in the treatment of prostatitis, there is always an excess of current, and the static current of small ampèrage and high potential produces no injurious effect upon any of the tissues so treated, and the loss is inconsequential when there is enough reserve to permit the spark-gap being drawn out enough to produce a local pulsatory effect upon the involved tissues. The static-wave current should be considered in this connection as a means only of producing tissue activity mechanically, without electrolytic or other deleterious action, and only from this point of view.

In ulceration of the urethra the indurated margins of the ulcers are the real cause of the persistence of the process and ultimately result in the formation of scar tissue. These ulcers under favorable conditions are promptly healed by the use of the direct vacuum-tube current or the wave current with the metal sound, because the indurated margins are thus softened, permitting the circulation of blood to the margins. The electrode or sound employed should be as large as can be passed rapidly, in order to bring the current in close contact with the margins of the ulcerated surfaces.

Extradural Sacral Puncture in Genito-Urinary Neuroses, according to S. P. Delaup,[8] are of value. He

(8) New Orleans Med. and Surg. Jour., June, 1911.

concludes that extradural injections with normal salt solution, or any mild analgesic solution, offer the most promising results in abnormalities of urination due to faulty vesical innervation; that incontinence of urine, enuresis, excessive frequency of urination (unless due to other pathologic conditions), can at least be ameliorated, if not cured, by extradural injections; that the immediate effects of extradural injections are very rarely even disagreeable, and, when cautiously performed the injections are in no wise dangerous to the patient, and no more painful than any other hypodermic injection with a mild solution.

Penicillium Glaucum Bladder Infection is reported by Chute[9]. A 61-year-old 3-para came under Chute's care in June, 1910. She had had trouble with her bladder as a girl, but her present trouble began about three years before with the symptoms of an acute cystitis. Two years before, because of her bladder pain, this woman was operated upon for a cystocele, rectocele and small caruncle or prolapse of the urethral membrane. As she had relatively little relief following this operation, her condition was supposed to be largely neurasthenic and she was advised to go without local treatment and, in so far as possible, to disregard her trouble. This she did for a considerable period, but a short time before Chute saw her she had been forced again to take up treatment. She had been etherized, her urethra dilated and her bladder touched with silver nitrate on three different occasions, in the preceding four months. This treatment had given her a good deal of temporary relief, and on one occasion she had remained comfortable for nearly five weeks, but after a time her discomfort referred to the bladder and her frequent and painful urination had returned.

It had been noted that her urine had contained for some time little white masses that floated on the surface. Previous to the last time she was etherized she had been given a dose of castor oil, and when her physician put an endoscope into the bladder he got several drops of fluid that had much the color of castor oil and

(9) Boston Med. and Surg. Jour., Apr. 1, 1911.

which was slippery and oily. This last circumstance, combined with a considerable bowel looseness, had raised the question as to the possibility of an entero-vesical fistula.

Chute found upon examination that the patient did not completely empty her bladder. Her urine showed a trace of albumin, but no sugar; it contained many little white floating masses. They were quite different from the little granular masses of pus that one occasionally sees, in that they floated on the surface. Her bladder, which would hold 4 oz. of fluid, was diffusely red and had lost its normal markings. At its vertex there were some brilliant white masses, irregular in shape, that at first sight were believed to be phosphatic incrustations on a new growth; there were also a few small white patches on the lateral bladder walls.

An investigation of the white masses in the urine showed that they were greasy when rubbed between the fingers, that they could not be satisfactorily stained with ordinary aqueous stains, but that they could be stained by hot carbol-fuchsin. The masses were made up mostly of amorphous material, but contained a certain number of round, tufted bodies, in some of which little dark bodies could be seen; in others there were little vacuoles or spaces as though similar bodies had occupied these. There were collections of what looked like very large cocci, but which seemed too large for any of the ordinary cocci and also varied more in size than is usual with cocci; they were thought to be masses of spores that had come from these spore-cases. There were no definite bacteria that could be recognized and relatively few pus cells. The white greasy masses were found to be soluble in ether and to burn on a loop with a snapping similar to that often seen with fatty substances. A second cystoscopic examination showed that the brilliant white masses at the top of the bladder could be moved about freely and by suprapubic pressure could be displaced into different positions; they were evidently masses of the white material that were floating on the surface of the distending medium.

There was no new growth to be seen and no sign of any communication with the intestine.

It seemed evident that her trouble was a very stubborn infection with some yeast or mould; also, in the light of her history, it seemed improbable that palliative treatment would be successful in relieving the condition. Her bladder was therefore, opened above the pubes. A considerable amount of the white material, and also some of the oily fluid, was skimmed off the surface of the distending fluid and preserved aseptically. The bladder surface was lightly rubbed with gauze and tube drainage established above, while a retention catheter was put in the urethra.

The preserved material, left at room temperature, showed, in a few days, a considerable growth of an ordinary mould. Henry Perry found in the broken-up masses a certain number of mycelia and sporangia of the *Penicillium glaucum* or common mould. Cultures made on various media showed nothing but *Penicillium glaucum*. It was at first thought that this mould might be an air contamination, but the fact that Dr. Perry noted that the cultures made on agar and potato produced in growing a yellowish oily fluid, such as was found in the bladder, seemed to argue against the probability of air contamination. It seemed to point to the fact that this oily fluid was a product of the growth of the mould under certain conditions, and that the white masses found in the bladder were due to a solidifying of this oily material when kept in contact with water. The fact that this white substance contained spores and was very light and floated, joined with the fact that this woman did not wholly empty her bladder, seemed to account for the difficulty in ridding her of the infection. The surgical course was uneventful; the suprapubic opening was allowed to close at the end of four weeks. At the time she left the hospital she emptied her bladder completely, and examination failed to show any of the oily fluid or white masses that had been found so constantly before. She also improved so far as subjective symptoms were concerned.

Urinary Tract Infection in Children. Of 121 cases analyzed by W. M. Jeffreys,[1] 67 were due to coliform microbes, 37 to staptylococcus, 10 to streptococcus and 7 to other bacteria. Five died of urinary infection and one of meningococcal meningitis, with a complicating *B. coli* infection. Fourteen cases were seen in 1910; 16 during 1909; 12 in 1908; and 9 in 1907. The others were seen during the previous six years, of whom one died from urinary disease in 1905. In 10 the onset came after acute specific fevers or other disease. In 34 there was bowel disease. In 10 the bowels were regular and in 16 evidence of their involvement was not found. The chief symptom in 37 was bladder irritability with painful micturition. In 3 vomiting and diarrhea first were noticed; in 9 abdominal pain; in 5 meningeal symptoms; in 4 debility; in 2, symptoms were not present. In 30 cases there was no evidence to suggest the mode of onset. There was evidence pointing to pyelitis in 30 cases; in 12 the right kidney only was affected, in 3 the left only. The renal trouble began in or was confined to the right kidney in 17 cases, the left in 5; in one of the latter the right kidney was more markedly affected than the left. In 8 cases there was no evidence to show which kidney was first affected.

Examination of the urine shows that pus was present in nearly every instance, 56 of 60. Albumin was present in 45 and blood in 15. The urine was acid in 39 cases, alkaline in 7, neutral in 1 and in the remaining 13 cases no note was made of the reaction. Casts were noted as being present four times.

Only 21 patients were discharged as being cured, that is to say, with no symptoms and no pus in the urine. Nine died; of these 6 died of the urinary trouble and 3 of some other disease, of which the urinary infection was a complication. Six were discharged *in statu quo ante* and 23 as improved; this usually meant that symptoms had abated but that pus was still present in the urine. Altogether 14 patients were untreated, except by rest in bed and nursing; of these, 1 was cured, 5 went out unchanged, 2 were improved, and 6 died, 3

(1) Quarterly Jour. of Med., April, 1911.

of the latter from some other complaint. Forty-six patients were treated with drugs, or local applications to the bladder, and 20 of them were cured; 4 with washing out the bladder, 1 with alkalies by the mouth, 5 with antiseptics by the mouth and 1 with vaccines. The remainder had various combinations of the above methods. The usual treatment was on three lines: 1. Alkalies. 2. Urinary antiseptics. 3. Local treatment of the bladder. These were usually combined. It is most important to treat the bowel condition by washing out the large intestines and keeping it acting by means of aperients, but being careful not to produce further irritation of the large intestine.

Tabetic Bladder. According to J. D. Barney [2] infection of the urinary tract occurs in over 50 per cent. of patients with tabes dorsalis. The mortality from such an infection is nearly sixty per cent. Catheterization and irrigation of the bladder, at regular and frequent intervals, combined with the constant use of an efficient urinary antiseptic (a) delay, prevent or reduce the activity of urinary infection; (b) postpone the appearance of residual urine, or diminish its amount if present; (c) relieve symptoms. Re-education of the muscles of micturition, combined with local treatment, would cure or relieve most of the symptoms which harrass the life of the tabetic. It is, therefore, of the utmost importance. The combined treatment of the nervous system and of the urinary tract is essential for the welfare of the patient.

Untoward Effects Upon the Bladder from Hysterectomies. G. S. Peterkin [3] reports 6 hysterectomies in which cystocele followed. Two had never borne children so that the perinea were intact. Of the 4 cases remaining, only one showed a perfect repair of the perineum and all 4 admitted attempt at repair had been made previous to the hysterectomies. Four of the 6 were vaginal hysterectomies. Peterkin concludes from these cases, that vaginal hysterectomy should be considered an antiquated operation, because proper care cannot be given to the support of the bladder and thus

(2) Boston Med. and Surg. Jour., Dec. 13, 1911.
(3) N. W. Medicine, January, 1911.

cystocele prevented; that, had the operators at the time of the operations given proper care to the bladder, cystocele would not have occurred, requiring a secondary surgical operation; and that, because hysterectomy is performed, there is no reason why perineal tears should not be repaired. Cystocele was the cause of the urinary symptoms complained of. It is true that the majority of cystoceles give no disagreeable urinary symptoms. A large majority of men over 60 have enlarged prostates, yet, roughly, 10 per cent. only require operation. What is cystocele but a postprostatic pouch?

Double Ureters are discussed by O. Pasteur [4] who finds 12 cases on record. In one case there were three ureter mouths. The catheter passed readily through two, but not through the third.

Ureteral Catheterization. The method of H. Kelly [5] according to A. H. O'Neal [6] allows of inspection of the bladder by the Kelly cystoscope. If only one ureteral orifice be found to be "puffy or edematous" or surrounded by an area of ulceration, the ureteral catheter is introduced only into this orifice, the urine then drawn by ordinary soft rubber catheter from the bladder itself, being said to come from the opposite kidney. The objections to this method are first, it is impossible to practice chromo-cystometeroscopy (a valuable method) by Kelly's technic and get the functional value of each kidney. O'Neal has recently seen in a case of his own, urine coming at the same time out of the ureteral catheter and out of the orifice of the ureter. In this case the right kidney was functionally perfect, but was infected by the colon bacillus. Imagine any correct conclusions from the method advocated by Kelly. Both kidneys would be declared to be functionally perfect. Secondly, a correct bacteriologic examination could not be made, as the infection from the bladder and both kidneys would be mixed. Therefore, how draw any correct conclusions? In the case mentioned above, both kidneys would be declared infected. Thirdly, if the bladder be infected, how can it be said that the kidney is not in-

(4) Ann. des Mal. des Org. Genito-Ur., April, 1911.
(5) Amer. Jour. Surg., January, 1911.
(6) Amer. Jour. Surg., May, 1911.

fected? This method, with one kidney functionally imperfect, the other kidney functionally perfect but infected, would certainly lead to wrong diagnosis.

Extraperitoneal Recto-Ureteral Transplantation. While, as R. Peterson has shown, recto-ureteral transplantation is in great danger of causing renal infection, operations are still done. J. V. Arumugum[7] reports two cases of extraperitoneal transplantation of ureters into the rectum for extraversion of the bladder 4½ years after operation. The first was in an 18-year-old Hindoo who was operated upon for extraversion of the bladder, and the ureters were transplanted into the rectum according to the method of Peters of Jaranto. The patient was discharged from the hospital 58 days after the operation. At the time he left the hospital he was able to retain urine in his rectum for about four hours during the day and for nearly nine hours at night, *i. e.*, (during sleeping hours, from 9 p. m. to 6 a. m.).

On April 15, 1907, a 13-year-old boy had ureters transplanted into the rectum for extraversion of the bladder, and was discharged from the hospital three months after the operation. This patient was able to retain urine in the rectum for about four hours during the day and for nearly five hours at night at the time of his discharge. This patient was seen by Arumugum on February 16, 1911, when he was able to retain urine in his rectum for nearly six hours during the day, and was at times disturbed at night only once between 9 p. m. and 6 a. m. The first case was last seen by Arumugum in January, 1911, when the patient was able to retain urine in his rectum from five to six hours during the day and for nearly eight hours at night.

The Testes and Scrotum.

Masculine Hermaphrodism is reported by M. Jalifier[8] in a patient who had been regarded as a woman for 57 years. Menstruation had never appeared nor had it in a sister, aged 55. At 19 the patient married,

(7) Amer. Jour. Surg., May, 1911.
(8) Lyon Méd., Dec. 20, 1910.

living with a husband 27 years. Jan. 27, 1910, she was suddenly attacked by severe colic in the right hypochondrium attended by nausea and general malaise. The patient came Jan. 28 to the hospital with a medical diagnosis of appendicular abscess. On entrance there was detected a non-ballooned depressible abdomen. Pain was not caused by pressure on it, but there was near the right iliac spinous process a fish-sized fluctuating tumor, slightly elevated, seemingly planked against the flanks in the right iliac fossa. Vaginal examination was arrested by a dome-shaped vagina without evidence either of uterus or adnexa. In the left inguinal region was a small projecting tumor following the line of the inguinal canal. Exteriorly the body was completely feminine. The vulva was well formed. Operation, Jan. 31, revealed a large pus-pocket in the muscles of the abdominal parietes. On the left was a testicle in a membrane resembling that of the vagina. This testicle had on it a cyst of its own size. On microscopic examination the structure was clearly testicular. The abscess had been due to an orchitis and there was ectopy of the abdomen. The case was clearly one like those pointed out by Windle [9] where sex education gives direction to the period of sex indifference.

Castration and the Breasts. According to A. Münzer [1] in certain cases only do male castrates develop a female breast. On the other hand gynecomasty may be found in normal men. In regard to women, the older writers seem to have looked upon a certain amount of atrophy as constant after castration. More recent writers declare that in the majority of cases the breasts show no change. Sellheim has shown that mutation of sex in certain animals after castration does not occur. Castrated hens do not act like cocks, nor do capons appear like hens. A change is usually in evidence in castrated domestic animals, but there is no real mutation in regard to sex. In other words a castrate does not change its secondary sexual character. Naturally, castration in the very young tends to cause more extensive alterations in the latter. The periodic enlargement

(9) Brit. Med. Jour., 1886.
(1) Berlin. klin. Wochenschr., Nov. 14, 1911.

of the muscles of the male frog's upper extremity, which occurs at the breeding season, and enables the male to grasp the female more strongly, disappears after castration, but can be resored by grafts. Abolition of such periodic phenomena is, of course, very different from radical change in permanent secondary sexual qualities.

Very early castration before development can but inhibit the appearance of the latter. But this inhibition is associated more or less with universal subdevelopment. In other words there is a genital infantilism. Möbius claims that in such cases sex cannot be recognized if the subjects cover the genital area. The genital glands in reality preside over general growth. They cannot determine sex. The vanishing of the periodic function like menstruation after castration is intelligible. Yet often a prolonged climacteric period succeeds, characterized by metrorrhagia, leucorrhea, etc. Fellner seems to have shown that the uterus possesses an autotoxic internal secretion, to which the lutein of the ovary is a natural antidote. By setting up menstruation it enables the uterus to be rid of its toxic material. The development of the ovary is responsible for puberty, (menstruation) pregnancy, and the climacteric, as well as for general devolopment of the mature organism. Yet it does not determine sex itself.

Hydrocele, according to J. R. Alvarez,[2] occurs in two varieties in the tunica vaginalis: (1) hydrocele communicans of congenital origin, and communicating with the peritoneum; (2) encapsulated hydrocele, which may or may not be of congenital origin, but does not communicate with the peritoneum. There are also two varieties of hydrocele outside of the tunica vaginalis: (1) where the effusion takes place between the tunica vaginalis and the tunica albuginea; (2) where the effusion takes place between the fibrous layers of the tunica vaginalis.

There are two varieties of hydrocele in coverings of the spermatic cord which correspond to the hydroceles inside the tunica vaginalis: (1) hydrocele funiculi

(2) Amer. Jour. Surg., May, 1911.

communicans, which communicates with the peritoneal cavity; and (2) hydrocele funiculi saccata which does not communicate with the peritoneal cavity. There are two varieties also of hydrocele outside of the coverings of the spermatic cord, that is, of the cellular tissue enveloping the cord, both very rare: (1) diffuse hydrocele of the cord, and (2) multilocular hydrocele. Hydrocele in the tunica vaginalis may exist in combination with hydrocele along the spermatic cord, or with hydrocele of the fibrous layer of the tunica. In both cases they intercommunicate, but neither of the sacs communicate with the peritoneal cavity. Although the effusion inside the coverings of the cord may extend into the pelvis, they are known under the name of bilocular hydroceles.

The terms, orchido-meningitis, vaginalitis, periorchitis, etc., by which hydrocele is often designated, cannot be used in as general a sense as the term hydrocele, for they imply that the disease is of an inflammatory or infective nature, which is not always the case.

Hydrocele frequently exists without history of previous inflammation or infection. This is especially so in the congenital variety and in hydrocele which develops late in life. These are thought to be due to a discrepancy between the powers of secretion and absorption of the structures involved. There may, however, be secondary effusion of fluids into other serous cavities, as the pleura, peritoneum, pericardium, etc., without concomitant hydrocele, even when there is general anasarca and great edema of the scrotum.

In the majority of cases hydrocele is due to inflammation and infection. Inflammation may be due to injury of the scrotum, testicle, epididymis, deep urethra, or it may be due to general infection as in pyemia, variola, etc. A very common cause of hydrocele in tropical and subtropical climates is invasion by the *Filaria sanguinis hominis,* which probably causes obstruction of the lymphatics; the effusion, then, without containing pus, may be milky in appearance, although it may be serous as in ordinary hydrocele. Epidemics of hydrocele occur without any assignable cause. Phimosis in children has

been known to cause it, cure of phimosis being followed by disappearance of hydrocele. Hydatid cysts are supposed to produce it. Hydrocele may be unilateral or bilateral; the two sides are affected with equal frequency. No age is exempt from it. Any agent injuring the structures or interfering with the functions of the serous sac of the testicle or of the spermatic cord will produce hydrocele. When hydrocele is due to inflammation and infection, the changes in the structures of the tunica vaginalis and of the coverings of the spermatic cord are identical with those of the other serous membranes and may be conveniently described as having three stages, serous, plastic and suppurative.

Testicle Hematocele or Testicle Cancer. H. F. Woolfenden discusses the differential diagnosis between these two states. A history of accident is generally present in both, but this sometimes calls attention for the first time to a state previously existing. A 23-year-old man had a left inguinal hernia with the scar of a radical hernia operation on the right side. There was an oval scrotal swelling, 3 by 2 inches. The skin over it was normal and not attached. The swelling was uneven in consistency, being harder in some places than in others; fluctuation was indefinite and no translucency was obtained. The spermatic cord was thicker than that of the other side, but no nodules were felt in it and there were no palpable lumbar glands. He had been struck on the scrotum by a spade two or three weeks before, and had noticed the swelling since. At the operation an incision was made through the skin of the scrotum, the tunica vaginalis incised anteriorly and found to contain a greenish fluid. The testicle was somewhat enlarged and hard, but showed no signs of new growth. As much of the thickened parietal layer of the tunica was excised as possible and the wound closed except for a small drain.

This case was diagnosed as hematocele. One of the reasons for operation was the fear of it being an early malignant disease, the blow having drawn the patient's attention to the enlargement and caused a rapid increase in the rate of growth. From the thickened and very

hard condition of the tunica vaginalis the condition probably existed before injury.

A 23-year-old man was admitted with an oval swelling in the left side of the scrotum about 4 by 3 inches in size. The swelling was even in consistency and smooth on the surface, and the epididymis could not be differentiated. Fluctuation was present, but no translucency was obtained. The cord was somewhat thickened, but no nodules felt in it, and no enlargement of the lumbar glands was detected. About eight weeks previously he had fallen off a gate and hurt his testicles. A few weeks later he noticed that his left testicle was larger than his right one. He was certain his left testicle was normal before the accident, but was not definite as to when enlargement came on. After the operation he thought perhaps the enlargement of the left testicle had started before the accident. At the operation the tunica vaginalis was found to be normal in thickness and to contain only a few drops of clear fluid. The testicle was very much enlarged, dark red in color; it had many large veins on its surface, the epididymis was spread out on the back of the tumor, and the cord, although somewhat thickened, contained no growth. The growth proved to be a sarcoma with some cartilage in it.

A 33-year-old man on admission had an oval swelling in the right side of the scrotum measuring 4 by 3 inches. The swelling was quite smooth, and no parts of the testicle could be differentiated. The sensation of fluctuation was very slight, and no translucency could be obtained. The cord felt normal. A history of the condition was not obtainable. This case was diagnosed as malignant disease, but proved to be an old hematocele. The condition, even at the operation, simulated malignant disease so exactly that the testicle and its annexa were removed.

These cases show that the resemblance between early malignant disease and old hematoceles may be so close as to defy the usual methods. In these cases the following signs were present:

1. The presence of a large tumor in which the details of the testicle had become obliterated. 2. The tumor

gave an indefinite sense of fluctuation. 3. The cord was only slightly thickened or normal, and one of the cases of hematocele showed this sign quite as well as the case of malignant disease. 4. There was an absence of translucency. 5. A history of injury was present in two of the cases.

Of course, in the later stages of malignant disease the markedly infiltrated cord and enlarged lumbar glands make the case obvious, but beyond surgical interference. Even when the cord alone is infiltrated, the patient rarely lives six months after operation without recurrence or development of secondary growths. The surgeon must interfere in malignant testicle while the signs are still doubtful and resemble those of a hematocele. All seeming hematoceles with thick walls should be operated upon, because there is not only the inconvenience of the tumor, but also the suspicion that they may be really cases of malignant disease. Even at the operation, when the testicle in its tunica has been delivered, it is impossible in many cases to say whether it is a thick-walled hematocele or a case of malignant disease. When in such doubt an incision through the tunica will clear up the diagnosis and probably do no harm, because in any early case of malignant disease the two layers of the tunica are not adherent and the growth is still confined by the tunica albuginea. Thus there is little or no danger of disseminating the malignant cells into the wound.

A 33-year-old man complained of a rupture. On examination there was a soft swelling situated over the position of the right external abdominal ring and extending for some distance outwards in front of the external oblique aponeurosis. This swelling gave no impulse on coughing, did not fluctuate, and was not reducible, although the patient stated that it had been always reducible until the last few weeks.

In the right side of the scrotum below this, and in the position of the testicle, there was a swelling about the size of a hen's egg, feeling rather hard and having a structure like the cord, passing upwards and disappearing under the upper swelling. The patient was an

intelligent man. He had noticed the latter swelling for the last sixteen months only, and three years ago he was examined by his doctor, who told him that he had an undescended testicle and hernia on the right side. At the operation the upper swelling was found to be an omental hernia, the sac of which, after coming out of the external abdominal ring, turned up in front of the external oblique, but the lower end of it was connected with the tunica vaginalis of the scrotum by a patent process. This process, however, contained no omentum. The testicle formed the lower swelling. It was about the size of a hen's egg, was reddish in color, had large veins in its surface and had the epididymis spread out on the posterior surface. The sac, spermatic cord, and testicle were removed as high up as possible and the inguinal canal closed. The testicle was found to be the seat of a carcinoma composed of spheroidal-shaped cells. Had this man's testicle descended owing to the increase in weight due to the growth of the tumor? The condition of the hernia bore out the statement, for it is not unusual to get the sac of a hernia, associated with a maldescended testicle, turning outwards in front of the external oblique.

Mumps and Orchitis with Primary Confusional Insanity is reported by W. H. Mitchell [3] in a 33-year-old negro, who after an attack of mumps had a fever followed by an agitated confusional psychosis. Mitchell three days later found his pulse rapid but regular, and of moderate tension. The axillary temperature was 104° F. The lips were tremulous and dry, the eyes were bright and staring. The pupils were dilated but reacted to light. The heart was dilated; the lungs were normal; the abdomen was flat; the spleen was not enlarged. The left rectus muscle was rigid, and some tenderness was present on pressure below and to the left of the umbilicus. The right rectus was quite flaccid. Nothing could be felt in the left inguinal canal. The patient resented this examination most forcibly, whereas he did not object to the right canal being examined. There was no discharge from the penis. The left testi-

(3) Lancet, Jan. 7, 1911.

cle was undescended and could not be felt; the right was present and normal.

Morphin sulphate was given hypodermically which quieted the patient so that it was possible to get him to take a little milk with calomel, gr. v. and pulv. jalap co., 3ss. Hot poultices were ordered to the abdomen. The next day the patient was very much better and no longer needed restraint. He had had some pain in the lower part of his abdomen, and his memory was "not too good," but otherwise he felt fairly well. His temperature was 100° F.; his pulse, 110. The tongue was dry and furred. The left rectus was less rigid. There was still tenderness on examination of the left canal. The patient could give no history of injury. The hot poultices were continued, and a quinin mixture was ordered. His diet consisted of milk and eggs. On the fourth day he walked about in front of his hut, apparently in the best of health.

The occurrence of orchitis in mumps is a well-recognized complication, but in an undescended testicle is rare. There was an interval of about a week between the parotid affection and the testicular complaint; this is in accordance with the usual sequence of events when the testis is affected. The interval rendered the diagnosis less obvious in this case. The fever, severe pain, rigidity of the left abdomen, and vomiting might readily have been diagnosed as acute inflammatory affection of the abdomen if the position of the testis and the history had not been taken into consideration.

Vesical and Renal Calculus.

Origin of Urinary Calculi. G. S. Gordon[4] points out that occupations and modes of life are conducive to stone. Age plays a part. The children of the poor, the affluent of middle life, and old people of all classes are especially subject to stone. Sex is almost a neglible factor. Boys are more subject to large vesical calculi than girls, because the former cannot void them when small as easily as girls. The frequency of renal calculus

(4) Amer. Jour. of Derm., May, 1911.

is about the same. Hereditary predisposition to stone must also be accepted. Climate seems to play no part, for stone is found in the natives of all climates. There is a coincidence of urate stone and gout in England, of neurasthenia and oxalate stone in France, but whether they bear the relations of cause and effect is not so clear. Of local diseases, we know that an uninfected foreign body in an aseptic part of the urinary tract will not form the nucleus of stone, but we also know that urealytic infection superadded produces triple phosphate stone. Spinal injuries may also result in triple phosphate stone formation because of the cutting off of the nervous control of infection, thus allowing pathologic micro-organisms to make headway in otherwise unassailable places. Trauma of the urinary organs and resultant hematuria may also lead to oxalate formation. The elements of calculi found in normal urine are uric acid, calcium oxalate, calcium and magnesium phosphates, ammonia magnesium phosphate, and coloring matters. Uric acid, mainly the end-product of intracellular katabolism of nucleins, and excreted into the circulation as such, in passing through the liver is transformed almost wholly into soluble urea to be thrown out by the kidneys. Large amounts of uric acid given hypodermically have consequently never resulted in stone. A certain amount is always found in urine, but usually when stone forms uric acid is not present in excess. What has been said of uric acid largely holds good of xanthin. It is uric acid only one degree less oxidized.

Oxalic acid is found in normal urine, usually in a soluble form. It is in the form of the calcium salt that it precipitates as envelope-shaped crystals in what is commonly known as oxaluria. This does not necessarily imply an excess of oxalic acid, for usually an abundance of calcium is free to combine with the oxalic acid in the urine. Oxaluria, therefore, is associated with calcaruria. Oxalic acid itself may be derived from oxalate-bearing food, such as rhubarb and sorrel; from the katabolism of gelatin-bearing tissues, such as cartilage; and, lastly, perhaps from the breaking down of uric

acid infarcts in the kidneys in lithiasis, so-called, to urea in which oxalic acid may be a by-product.

The acid phosphates of calcium and magnesium are very soluble and are mainly responsible for the acid reaction of the urine. Those phosphates which contain more calcium and magnesium are less soluble and form precipitates in what is known as calcaruria, or more correctly alkalinuria. Whether phosphates are precipitated or not is consequently only a question of the relative amounts of phosphoric acid and of calcium and magnesium eliminated into the urine.

The sources of calcium are: first, ingesta, especially alkali water, lime water, and Epsom salts; and, second, the breaking down of calcium- and magnesium-bearing tissues, such as bone. This is especially marked in some forms of neurasthenia, and in old age, when lime infarcts form in the kidneys. Calcium may be eliminated in greater amount in the urine when catarrh of the big gut handicaps its function of calcium excretion. In hyperacidity of the stomach more lime is absorbed and eliminated in the urine than in health. Cystin, or its isomere, is found in normal urine. Its origin is obscure. Carbonates and triple phosphates, when associated with infection, are capable of breaking up urea into carbonic acid and ammonia. Traces may be found in normal urine, but stone does not form without this pathologic supply, and not then, unless the urinary tract is invaded as well as the urine.

The coloring matters of the urine are colloids, whose function is to attach to themselves the particles of uratic, or other, crystalloids in the urine when it becomes supersaturated, and hold them in suspension for expulsion in the urine, or for solution again, should the urine become more dilute. Urate stone probably owes its color to them, all the urinary salts of uric acid being colorless.

These constituents of stone are not the important ones. They are found in normal urine, and stone is a pathologic product. Stone forms irrespective of the abundance or partial deficiency of these. This supply is practically always present, but is voided in solution or as precipitates. What is it then, that agglutinates

these salts into stone? That is the substance or substances of which it is important to know all that it is possible to know. Once we have the cement for these salts to bind them together before they can be voided, we have potential stone; continue this supply, but vary it or the salts in amount, in the meantime having the gravel detained, and stone forms in layers. These layers vary in density, if of the same materials. They may also vary in materials, so that it is very common to see an oxalate surround an urate, or *vice versa,* while triple phosphate, following infection, forms an outer coating to most stones. These cements are probably all colloids, but not the colloids of normal urine. The latter absorb particles and release them. The colloids of stone absorb particles, but do not release them. These glues stick together the urates, oxalates, etc., and then become converted into an insoluble matrix.

The best known of these so-called irreversible colloids are perhaps mucinogen and fibrinogen, which on standing are transformed into mucin and fibrin, and then become incapable of reverting to their original form. Stone crystals imbedded in these jelly-like materials, as time goes on ultimately find themselves in a stringy net-work, which not only keeps them enmeshed, but also renders them urine-proof. There are several cement materials which have special affinities amongst the normal salts of urine to the exclusion of other salts. The administration of uric acid in any amount will not cause urate stone to form; but the administration of adenin to dogs produces it. Adenin is not found normally in the blood, but it occurs intracelcularly in the processes of katabolism. Oxidized, it becomes uric acid. Now if a cell is deficient in power to oxidize its waste to uric acid, it may expel this adenin into the blood, and so stone may result as it does in the administration of this substance experimentally. This toxin sets up nephritis and it is this nephritis which we look upon as specific, capable of producing an inflammatory exudate containing a cement which will bind uric acid into gravel and ultimately into stone. We are dealing with a specific, chronic leucomain poisoning.

Schade made mixed oxalate and phosphate stone by beating up these salts in ox's blood. Israel has found iron in oxalate stone, presumably from its blood content, for whatever the external color of oxalates, on section they are the shade of stale blood. It seems not improbable that all oxalates have blood for a matrix. It may be freed by trauma, by external violence, by a stone already formed, or by the passage of oxalate crystals themselves through the renal tubules. It is probably fibrinogen and allied substances in the free blood which is the cement, as whipped blood gives no such result with oxalate salts. The frequency of oxalate stone in old age may be due to the hematuria of sclerosed kidneys, most commonly found at this period of life.

Fibrinogen from free blood is probably the sole origin of fibrin calculi. The blood clot is held back, undergoes fibrinous changes before it can become infiltrated with crystals, and becomes a bleached out mass of almost horn-like consistency.

The matrix of triple phosphate stone is formed by the action of pathologic micro-organisms which have also the power of splitting up urea into carbonic acid and ammonia. The slime associated in the minds of us all with ammoniacal urine, which is an inflammatory product perhaps containing mucinogen, is the cement substance in question. The matrix of calcium carbonate stone and of calcium magnesium phosphate seems to be that of any other stone in which the reaction of the urine will allow it to precipitate. These salts almost always adulterate triple phosphate and calcium oxalate stone, but Gordon has never seen a pure calcium carbonate or calicum phosphate urinary calculus, and doubts their existence. The matrix of cystin stone is the product of a toxin somewhat similar in action to adenin.

The practical application of these hypotheses lies in prophylaxis. Katabolism, associated with urate stone for the most part, seems deficient in oxidation power. We may be able to force fuller combustion within the cell itself of its nuclein waste by using a forced draft—physical exercise—to draw in more oxygen through the lungs; and secondly, by the administration of metals

capable of carrying oxygen in many combinations, such as iron, arsenic, manganese and last but not least, mercury in small doses. Most of us know the power of Donovan's solution to relieve headaches, in what is commonly known as lithemia, which is probably an autointoxication with leucomaines, of which adenin is one. And lastly, alcohol, because of its deoxidizing effect on blood, should be prohibited to people with uratic dyscrasia. For nephritis, once established, the usual measures to prevent overloading the kidneys, such as diet, baths, etc., should be adopted.

To prevent oxalate stone from forming in cases of wounds of the urinary tract, abstention from food containing much calcium or oxalic acid is necessary. Urate stone should be removed before it causes hematuria by wounding its bed. In oxaluria, combined with phosphaturia, in neurasthenic states, phosphoric acid should be administered. For triple phosphate stone, avoid urealytic infection by curing, when present, gonorrhea; by removing any obstruction to urination; by removing foreign bodies in the urinary tract, whether introduced from without, or of pathologic production, such as urate, or other stone; secondly, when such infection is present, control it as much as possible with hexamethylentetramin, and lastly, and what is of very considerable importance, when urealytic infection is present, do not administer lime or magnesia, or alkali water, for they may so increase the supply of crystalloid material in the urine, that masses of agglutinated, triple phosphates, which would otherwise be voided, will grow so rapidly as to attain operable size. To prevent the formation of all kinds of stone, abundance of good water is to be recommended. Bio-chemistry is presumably better carried on in dilute media, and stone materials in the urine are more apt to be voided before stone can form.

Vesical Calculi are discussed by W. F. Haslam [5] who sent out a questionaire to British surgeons as follows: What operation do you usually perform for the removal of a stone before the age of puperty? There were 221

(5) Lancet, Mar. 11, 1911.

replies. From an analysis of these figures it is clear that the suprapubic operation is the one usually performed. Seven only refer to lithotrity as the method adopted, without any reference to the size of the stone or other circumstances. The others who perform lithotrity do so only after making choice of such cases as seem suitable, in their opinion, for the operation. The lateral operation as well as the median are still mentioned, though apparently are very seldom performed.

To the second question, What operation do you usually perform for the removal of a stone from the male bladder after puberty when there is no evidence of prostatic 'enlargement? there were 240 replies. These returns show that surgeons are prepared to consider the advisability of performing lithotrity in the adult more frequently than in boys, but the number of those who practice the suprapubic operation is in excess of those who use lithotrity, and it should be noted that of these a large number reserve it for small stones, doing the suprapubic operation for large ones.

The third question, as to the treatment of stone when there is evidence of prostatic enlargement, elicited 224 replies as follows: For the treatment of stone in the presence of an enlarged prostate the suprapubic operation is, for these returns, the method adopted by almost all surgeons, only 16 out of 224 being prepared to discuss the desirability of attempting lithotrity under these conditions.

The fourth question dealt with the treatment of the wound in cases of suprapubic lithotomy. There were 230 replies. The chief point of interest in this question is as to suture of the bladder and of the abdominal wall, and whether a drain should be used or not. It is evident that there are few surgeons who venture to sew up the bladder and close the abdominal wound without some form of drainage, though there are many who will close the bladder and use a drain to it; while rather more than half the number prefer to use either partial suture or none at all.

Ureteral Stone. According to H. Cabot[6] ureteral

(6) Boston Med. and Surg. Jour., Nov. 24, 1910.

catheterization and radiography enable one in the majority of cases to know beforehand in what portion of the ureter a stone is situated. The majority of stones lodge at one of three points. 1. The physiologic constriction just below the pelvis of the kidney, about on a level with the lower pole of the kidney. 2. At the brim of the true pelvis where the ureter crosses the iliac vessels. 3. In the lower two inches of the ureter, near its point of entrance into the bladder wall. The author believes that incision on the stone in the ulcerated tissue is almost certain to result in some sloughing of the tissue, and that the already existing tendency to stricture is increased by the fact that suture further narrows the ureter, and that the sutures are likely to cut through with further sloughing. It is safer to incise the ureter one or two inches above the stone, then with suitable forceps passed into this opening, to withdraw the stone and extract it through the incision. Freedom of the ureter from obstruction is essential to success. This permeability may be ascertained by passing a small *bougie à boule* downward to the bladder and upward to the kidney. If stricture of the ureter be found it must be relieved either by the internal ureterotomy of Albarran or other method. Cabot's experience with inlying catheters in the ureter does not encourage the belief that their presence is not objectionable, as they undoubtedly favor infection. It is customary to put drainage in the abdominal wound down to the suture in the ureter. In 3 recent cases, 2 of which were aseptic and one markedly infected, no drainage has been used.

Renal Calculi are discussed by M. Rafin [7] who finds that in 287 aseptic cases operated upon the mortality was 4.5 per cent. Of these 34 were pyelotomies without a death and 193 nephrectomies with 4.6 per cent. of deaths. In 158 infected nephrectomies the mortality was 18.4 per cent. and in 7 pyelotomies the mortality was 5.3 per cent. In 60 other cases the calculi were bilateral. One of Borougermia's patients needed 5 operations before recovery followed.

Errors in the Diagnosis of Calculus by the Roentgen

(7) Lyon Chir., Apr. 5, 1911.

Ray are, according to H. K. Pancoast,[8] due to obesity; inadequate preliminary preparation of the patient; conditions of the abdomen or pelvis which offer shadows of such unusual density as to obscure those of the kidney or, a possible calculus, such as the pregnant uterus tumors, cysts or ascites; surgical dressings, drainage tubes, etc; the presence of unusual or abnormal conditions or objects which cast shadows that may simulate those of stones in the kidney or upper portion of the ureter: first, those outside the kidney, such as calcified lymph glands, foreign bodies in the intestinal tract, especially the appendix, foreign bodies in the abdominal parietes, irregular areas of calcification in the lower costal cartilages, scar tissue, and moles; and, secondly, those within the kidney, such as pyelitis, abscess, or scars; misplaced or supernumerary kidneys or ureters; conditions or objects which may, by their shadows, lead to error or confusion in the diagnosis of calculus in the lower portion of the ureter, such as phleboliths, calcified lymph nodes and sesamoid bones; certain anatomic structures, such as stones obscured by the shadows of the pelvic bones and the lower ribs; the consistency of the calculus; and lack of adequate clinical knowledge of the case on the part of the examiner.

Obesity has in the past been the greatest of the previously recognized obstacles, but fortunately the improvements made in apparatus, tubes and plates, means of controlling the *x*-ray output, the compression diaphragm, and the recent production of an intensifying screen of practical value, have rendered the examination of any but the very stoutest of individuals one of comparative ease and certainty. The comparatively high percentage of secondary radiation given off by hydrocarbons,—and therefore by fat,—and the resulting loss of detail this entails, is the one difficulty in connection with obese patients that we have so far been unable to overcome satisfactorily. The greatest chance of error in failing to find a stone that is present lies in the combination of obesity and the forms of calculi which have but comparatively slight degrees of density, such as a

(8) Amer. Jour. Derm., May, 1911.

pure acid stones. With such a combination, occasional mistakes are bound to occur.

Inadequate preliminary preparation is a factor that frequently leads to errors in interpretation, but is one for which the Roentgenologist is less to blame than the clinician or surgeon, who certainly should realize the great importance of this essential part of the technic. Perhaps patients are now less frequently than formerly referred for examination without previous starvation and thorough evacuation of the bowels, but the latter still continues to be carried out carelessly or inefficiently. The presence of gas in the colon is even more misleading than that of fecal matter, because it is apt to render the outline of the kidney shadow uncertain, and collections of gas around a small fecal mass, frequently add so much contrast to the shadow of the latter as to give it a relative density equal to that of a stone. It might be well to reiterate the fact that pills or tablets should never be the form in which laxatives are administered for this purpose, nor should any drugs be given in these forms for at least twenty-four hours preceding the examination.

The pregnant uterus, tumors, cysts and ascites are always likely to obscure the shadow of a calculus, and this fact should be borne in mind both by the examiner in rendering his diagnosis and by the clinician or the surgeon in accepting it.

Unusual or abnormal objects casting shadows as dense as those of calculi will occasionally present a radiographic appearance so closely simulating that of stone in the kidney or upper portion of the ureter, as to mislead anyone. It is not uncommon to find such shadows in the radiographs of patients who exhibit typical signs and symptoms of stone, but in whom none is found at operation, as most surgeons can recall. Calcified lymph nodes, fecal concretions, especially in the appendix, foreign bodies elsewhere, and irregular calcifications of the lower costal cartilages, which are common in young, thin women, may all be readily distinguished from renal calculi by means of the stereoscopic examination, with or without catheterization of the ure-

ter. One should be on his guard against possible errors arising from the presence of scar tissue or moles. The distinction between the shadows of stone and those due to pyelitis, scars in the kidney, or absence of that organ is not always an easy one to make, but in the case of abscess, a mistake is not often serious, because the treatment is usually the same in either instance.

Since the examiner should never feel satisfied unless he is able to obtain the shadow of the kidney, displacement of that organ is not so often a source of error as formerly. A stone in a supernumerary kidney would be a condition likely to confuse anyone. Misplaced or supernumerary ureters require the aid of the ureteral catheter for their recognition.

The pelvis is the seat of a host of objects whose shadows may lead to errors in the interpretation of radiographs. Phleboliths in the pelvic veins are so common as to be found in the vast majority of individuals, but their usual positions, size, shape and arrangement are so characteristic that their shadows are readily distinguishable from those of calculi, as a rule, provided the proper technic is followed. Occasionally, however, there is some difficulty in distinguishing between them and calcified lymph nodes or sesamoid bones and stone, and whenever any such uncertainty exists, an examination should be made with the ureter catheterized. It is never safe to base the interpretation of such shadows upon the fact that the catheter passed at another time has or has not met with some obstruction, but the shadow of the catheter should be on the plate. Even then, it is advisable in some instances to make a stereoscopic examination with the catheter in the ureter. It is possible for a stone to be present without producing a perceptible shadow on the radiograph, because pure uric acid calculi possess such a slight degree of density that they may not produce a distinguishable shadow in any but a thin individual. Fortunately, such stones are comparatively uncommon. It is a wise rule to confirm the findings of a positive examination before submitting the patient to an operation for the removal of a stone.

MISCELLANEOUS,

By

HAROLD N. MOYER, M. D.

MISCELLANEOUS.

History of Medicine.

The Most Ancient Medicinal Preparations. C. E. Daniels[1] gives a very interesting and somewhat facetious account of the history and method of preparation of theriaca (Venice treacle, a compound containing 70 or more drugs), which was in use in the second century before the Christian era, and which is still noticed in some pharmacopœias of the present day. It is found in the *Codex mediacamentarius* or French Pharmacopœia of 1884 and also in the German Pharmacopæia of 1872; and Hager in his commentary on this edition tells us that Andromachus, the physician of Nero, introduced theriaca into the materia medica, so that it is more than 2,000 years old. He regards it, therefore, as the most ancient pharmaceutical preparation, and says that it seems to him that one might well respect its age for he ventures to suppose that he will be permitted to distinguish it as a "record."

Ancient history teaches us that there were in the last two centuries before our era several persons of importance, members of the reigning families, who occupied themselves in an amateur way in the study of medicines and poisons. There have remained to us several proofs of their pharmaceutical labors. Theriaca recalls to us the glory of the chief of the amateur pharmacists: of Mithridates the King of Pontus (138 to 63 B. C.); of Attalus; of Philometor, King of Pergamus; and of Cleopatra, Queen of Egypt, not to cite others. Mithridates endeavored to immunize himself against the effect of various poisons, and with this in view prepared for himself a collection of antidotes which he always carried

(1) Janus, June, 1911.

with him in the various battles that he fought with his enemies. And when he was conquered in 63 B. C. by his own son Pompey he attempted poison himself, but without success, because, in truth, he had rendered himself invulnerable. For this reason he was obliged to have himself killed by one of his own soldiers to prevent his falling into the hands of his enemies. Through Pompey this collection of drugs was transported to Rome and later fell into the possession of the Emperor Nero whose ideas were little different from those of Mithridates. Nero thought so much of the Mithridatic antidote that he commissioned his physician Damocrates to study its composition.

Daniels gives a page of prescriptions indicating the composition of these mixtures and states that when the mass was well mixed it was turned into a dish of glass or of silver, leaving an empty space which permitted the medicine to ferment for two months. The mixture was agitated in the sun every six or seven days. The fermentation was not finished until six months had passed, but to secure the best effects the theriaca was not to be used until it had been prepared for five or six years. The medicine was said to keep its properties for more than sixty years.

A physiologic test was recommended to determine the good quality of theriaca. A little of this mixture was given to some wild cocks and then they were exposed to the bites of vemonous beasts. They were preserved from all accident. It is said that Mithridates made use of the blood of Pontic ducks, that is to say, ducks which had been given various kinds of poison to eat, and of which the blood was employed as an antidote on the theory that in these immunized animals there must be formed antitoxic bodies. The dried blood was taken with wine as a counter-poison or antidote. We have here perhaps the earliest example of an application of the theory of immunity.

Whether Nero was dissatisfied with the analysis made by Damocrates or not, he afterwards employed his head physician, Andromachus, to examine the substance anew, and if he judged necessary, ordered him to change the

original composition of theriaca. This Andromachus did, especially by adding a new constituent—the flesh of the viper. As Peters says, this use of the viper's flesh was evidently founded on the idea that serpents and vipers must necessarily have in their bodies an antidote against their own poison, and that this counter-poison could be considered a remedy for other venoms, as in the seventeeth century Oswald Croll had already said that in nature ordinarily the best antidote was to be found by the side or in the neighborhood of the most dangerous poisons. The consummation of the manufacture of theriaca by Andromachus was celebrated by a Greek poem of 180 lines in which he explains his work and the different motives which led him to the achievement. Other authors have also written in praise of this wonderful remedy, and Daniels quotes especially two letters written by Galen, one to his friend, Piso, and the other to his pupil, Pamphilianus.

Daniels mentions the celebrated manuscript of Galen which is found in the Dresden library, and which indicates how much value Galen attached to theriaca. This admirable edition is a masterpiece of great artistic value. Daniels reproduces one of the forty-six designs which an artist of unknown age has inserted in it, which is described by Mr. Martin as follows: Galenos in a red cloak, blue *soutane*, seated on a throne of gold with a blue back ornamented with gold, is explaining the preparation of the very complicated medicines which composed the theriaca and the Mithridatic antidote. They are black in brown boxes, arranged on a long table. The servant who is showing them is dressed *en pourpoint rouge* with a white apron and brown pantaloons. The first pupil to the left is in blue, the second in red sleeves and green pantaloons, the third in red, and the fourth in gray with brown sleeves and red pantaloons. To the left on the gray wall one reads the first words of the chapter "Inquit Galienus." The pavement is yellow with gray lines.

Daniels remarks that since the beginning of commerce in drugs there has been a tendency to substitute an adulteration, and it became necessary in Venice as

early as 1172 to attempt the suppression of such traffic by the appointment of a committee named "Giustizia Vecchia" whose business it was to supervise the druggists and pharmacists who were enrolled as Aromatarii. This supervision was increased in 1258 by the formation of the "Capitolare Medicorum et Spetiarorum" which regulated the mutual relation and ordered that a preparation which cost more than 10 solvi must be presented to the regency or must be prepared in the presence of the municipal authorities. The complicated composition of theriaca was the reason why the preparation was required to be put together in the presence of the communal authorities, especially because in those times sufficient means were not available for recognizing adulterations as we know them to-day. It is to this fact that we very probably owe the public preparation of theriaca. It is difficult to say when and where this first took place. According to Schelenz, the Professor of Pharmacognosy in the University of Padua, Prospero Alpino (1553 to 1617) who between 1580 and 1583 made a voyage into Egypt tells us: "In the temple Morestan, at Cairo, theriaca was prepared. At the command of the prefect the physicians assembled there to choose, under the direction of the chief physician, the pharmacist most expert in that composition, who prepared in the presence of all his assistants the necessary pastilles of the viper, or the troches of Tyro, and mixed them with all the other ingredients for theriaca." Schelenz also says that the prescription for this preparation remains secret, because its publication would have been very injurious to commerce with Italy, Germany and England; but Alpino declares that he found by chance at the house of a learned botanist in a box a prescription which he had deciphered with the aid of a friend who knew Hebrew, and the wise physician, Octavio Roveredo, and which was recognized to be an Arabic prescription for theriaca.

Further, it was absolutely desirable for Venice, where the wholesale merchants of northern Europe had their headquarters, to take care that one might be able to purchase there, and there alone, the principal ingredients

for the renowned remedy that the world owes to Andromachus. Consequently the druggists of Venice, desiring to be independent of the varying harvest, or rather the chase of vipers in northern Italy, established their own gardens for vipers in the same way that pharmacists establish their gardens of plants, with a view of securing the vegetable ingredients for theriaca. A native of Amsterdam, named Gysbert Horst, living in Rome, who had established for commercial purposes a garden of vipers, received there one day a visit from his compatriot, a physician named Bernard Dessenius van Cronenburg of Groningue, and this gentleman relates that he was strongly impressed with the fact that the servants cared for these monsters without fear.

Other notices of the manufacture of theriaca are given, and the care taken to be sure that the genuine viper was used in its preparation is described. It is stated that at the beginning of the sixteenth century theriaca was prepared publicly at Lyons, in the Hôtel de Ville, which had just been finished. Before beginning the preparation, properly so-called, the drugs and vipers had to be exposed for from eight days to a month, in order that every one might verify their value. Notwithstanding these precautions a Lyonese physician raised doubts as to the value of this preparation of theriaca, as the vipers did not come from the Roman Campagna, which produced great excitement in the city, so that other measures were necessary to prove to the people the efficacy of the theriaca. A. Florence states that this demonstration took place before the archbishop in the presence of the Duke of Nemours by causing a valet to be bitten by a female viper. The servant, having been previously protected by the antidote, recovered. The result did not convert Dr. Pons, but the king was perfectly satisfied and continued the use of the Lyonese theriaca.

The preparation thus described seems to have served the purpose of a mixture of antiseptics with tonics and stimulants modified by the sedative action of opium, and to which was added, in order to facilitate their assimilation an eminently diuretic substance, squills. Not-

withstanding the great age of the formula it is a rational one. L. Meunier adds: "And then is it not curious to find in this mixture the attenuation of a virus, and above all, the predominating element of contemporary therapeutics, antisepsis, which is the basis of all medication, since there is more and more a tendency to admit that most diseases are only intoxications?" A. Robin has published his opinion in the Bulletin of Therapeutics, Sept., 1904, in these terms: "When one analyzes the effect of this ancient drug, theriaca, he is obliged to recognize the fact that the ancient physicians had a clear conception of the necessity of vitalizing, as one says to-day, the substances which they employed. We have not invented anything. They had learned that in order for a substance to be assimilated in the organism, it is useful and necessary to combine it with organic substances. We do nothing else in most cases. Simply being better instructed to-day, we are able to substitute for the strange drugs of the past analagous compounds, —for instance, phosphate of calcium and carbonate of magnesium for album græcum and for the human skull; albumin for the flesh of the viper, etc."

In fact, says Daniels, as long as man has existed has he not been travelling in a circle?

Contribution of Semmelweis to Medicine. R. C. Newton [2] gives a sketch of the life and work of Semmelweis of which the following are some of the prominent points. Ignaz Phillip Semmelweis was born in Budapest, in July, 1818, and died in Vienna in August, 1865. In the study of medicine he developed a strong taste for midwifery, and in 1844 he took the degree of master of midwifery and obtained the position of assistant to the Clinic of Obstetrics attached to the Vienna General Hospital. In his work in this clinic he applied himself with considerable assiduity to the pathologic study of the bodies of women who had died from gynecologic diseases and operations.

There were two clinics, the first for the instruction of medical students, and the second for the instruction of midwives. In the course of the instruction of the medi-

(2) Med. Record, Sept. 10, 1910.

cal students, permission was given the students to examine any or all of the patients. Frequently these examinations were made by students who had come recently from the dissecting or necropsy rooms. Semmelweis noted the extent and serious character of puerperal fever which occurred in the clinics. His attention was drawn so strongly to this subject that he could not content himself with the ordinary studies or enjoyments of his colleagues. He could not accept verbiage for reality, nor amuse himself with toys. His heart bled for the sufferers he saw sicken and die daily while under his care. The constantly recurring questions before his mind were: What is puerperal fever? How does it arise? What treatment can prevail against it? Newton gives a sketch of the theories of the time regarding the character of puerperal fever, and cites the following case as illustrating the simple faith of that day in the supposed terrible power of the epidemic of puerperal fever.

A woman suffering from a fibroid polypus of the uterus was admitted to the clinic and the tumor was removed in the usual way. The patient soon showed the symptoms usually noted in puerperal fever and shortly afterward died. Post-mortem examination revealed lesions identical with those commonly found in puerperal fever. Dr. Chiari explained this state of things by declaring that the patient had actually died from puerperal fever, although she had not been pregnant nor passed through the puerperium, because, as he alleged the epidemic influence of the fever had become so strong that it had even carried off non-puerperal women. This he explained might happen in cases where the epidemic influences were exceptionally virulent.

Some theorists explained that the fever was due to the suppression of lactation, while others attributed it to suppression of the lochia. The so-called gastric bilious fever theory had a considerable vogue in England at one time. The severe cases of puerperal fever were also called putrid fever, while a number of authorities held that inflammation was the central fact in child-bed fever. About the middle of the eighteenth century we find the first reference to erysipelas as closely

associated with child-bed fever. Gordon of Aberdeen alleged that puerperal fever was an erysipelas of the bowels and peritoneum. By the middle of the nineteenth century the almost universal belief in England and America was that puerperal fever and erysipelas were analagous. Others believed that various infectious diseases when attacking the puerperal woman lost their characteristic features and assumed the form of puerperal fever. Gradually investigators had come to believe some sort of contagion, but without definite ideas as to its method of propagation. Another dominant idea was that of the *genius epidemicus* which was supposed to be a miasma that might extend over a vast area or be restricted to a single town or even to a single building, such as a hospital where it was especially prone to develop if there was an overcrowding of puerperal or pregnant women. (It should be noted that even before the time of Semmelweis the idea of contagiousness in puerperal fever had gained considerable hold in England, and in America had been put forth by Holmes in his master essay.—Ed.) We still find Virchow in 1861 and Barnes in 1875 teaching the mysterious origin of child-bed fever. Older practitioners can still remember the talk about the *locus minoris resistentiæ* and the malign effects of sudden emotion, indiscretions in diet, and changes of the weather on lying-in women. Is it to be wondered at then that when Semmelweis made his great discovery he found like Copernicus and Galileo a wall of prejudice and human vanity directly in his path which made his progress exceedingly difficult?

A marked difference in the mortality records of the two clinics was noticed and had become so great that the patients themselves were aware of the dangers of being delivered in the first clinic and begged and prayed with lamentations not to be sent into its wards.

Semmelweis had noted all these things, but their true significance had not yet dawned on him. In 1847 (March 20) Professor Kolletschka, whom Semmelweis especially honored and esteemed, received a prick of the finger in making an autopsy. He therefore became afflicted with lymphangitis of the arm, followed by pleu-

risy, pericarditis, peritonitis, and meningitis, from which he died in a few days after the initial infection. Shortly before his death a metastasis occurred in one of his eyes. The autopsy revealed a series of lesions identical with those found after death in child-bed fever. As Semmelweis says: "Excited as I then was, it entered into my mind with irresistible clearness that the disease from which Kolletschka had died was identical with that form which I had seen so many lying-in women die.

Semmelweis promulgated the following assertions: "Puerperal fever must always be considered as a fever due to the absorption of decomposed animal, organic matter. This absorption may result from *auto-infection* (the product of infection coming from the individual herself) or from *hereto-infection* (the product of decomposition coming from without). Consequently not only the cadavers of every age and of every sex, when they are in a state of decomposition, but also the sick of every age and of every sex whose disease is accompanied by the decomposition of organic, animal matter, and, furthermore, every animal the organic tissue of which presents a certain degree of decomposition—every one of these may be the starting point of puerperal fever."

This is unquestionably sound pathologic doctrine. Had Semmelweis only had some knowledge of bacteriology his name would have been bracketed with those of Lord Lister and Pasteur. However, he deserves far more recognition for what he did than he has so far ever received, and doubtless time, which makes all things equal, will do justice to the reputation of a great and unselfish benefactor of the human race. Like all promulgators of a new and startling truth, he met with but scant appreciation when he first announced his discovery, and he had the misfortune to excite the enmity of his superior, Professor Kline, who had little sympathy for reformers, or even for investigators of any sort. This latter functionary prevented Semmelweis from obtaining a reappointment for two years as assistant to the Obstetric Clinic, a privilege which had been granted to his predecessor.

In consequence of the opposition to his views, and the persecution to which he was subjected, Semmelweis, although his claims were favorably received by the Vienna Medical Society, finally yielded to the pressure of the efforts of his enemies to drive him from Vienna, and settled in his native town, Budapest. Students of his life think that his sudden and ill-judged retreat from Vienna was due to an uncontrollable impulse, and was an early manifestation of the mental malady which finally carried him into an insane asylum.

Newton says: "We have no time to follow this interesting man into his new field of labor, where his great learning and industry finally brought him sufficient recognition to secure him the chair of obstetrics in the local hospital, and where his abilities secured him a living practice. He wrote a book setting forth his theory and its proof. The latter part of the work, particularly, is burdened by long and ill-natured tirades against his enemies and those who refused to accept his doctrine, showing a gradual undermining of his crisp and vigorous intellect by the increasing mental alienation.

"After his entrance into the asylum it was learned that he was suffering from a septic wound of one finger which terminated in pyemia and pyopneumothorax from which he died August 13, 1865. It is a remarkable thing that he died of the disease which he had all his life fought so vigorously and finally succeeded in explaining so clearly. There was quite as much reason really for calling his fatal malady puerperal fever as for saying that the septicemia that carried off the patient of his friend Dr. Chiari in 1844, of which we have already spoken, was puerperal fever. An autopsy revealed the fact that Semmelweis had suffered from chronic degenerative changes in the brain and that those changes had been progressing for a considerable time."

In a report of Haller's on the work of the General Hospital in Vienna several pages are devoted to a discussion of Semmelweis's discoveries, and the opinion is expressed that its bearing should be of inestimable importance to surgery. This was in the spring of 1849 and was probably the first time in the history of medi-

cine that any suggestion had been made regarding the importance of observing prophylaxis, that is, asepsis in surgical practice.

Newton closes as follows: "I cannot close this meager account of a most interesting personage without paying a tribute to his kind and manly heart. Had his pity not been stirred by the unfortunate women condemned to suffering and death while paying to nature the sacred debt of perpetuating their species, probably his great discovery would never have been made."

"Consider," says Carlyle, "how the beginning of all thought worth the name is love, and the wise head never yet was without the generous heart."

Ancient and Modern Humorism. In an address delivered at the International Congress of Physiology held at Vienna, Sept. 27, 1910, Charles Richet,[3] professor of physiology, University of Paris, discussed the contrast between the humorism of the ancients and that which characterizes the attitude of modern physiology. The ancients believed in four humors, the blood, yellow bile, black bile, and phlegm, two of which, black bile and phlegm had no existence. By the force of tradition and in spite of observation, the belief in these humors was transmitted from one generation to another until with the Italian anatomists of the Renaissance the orientation of physiology changes, and humorism was replaced by mechanism. The influence of anatomy with its refinement of microscopy, lasted well into the nineteenth century.

Modern physiology, however, with a chemical interpretation of life, was born with Lavoisier. This interpretation has led to a modern humorism depending on experiment and very distinct from the theoretical humorism of the ancients. Richet characterizes this modern attitude of science under a number of laws, or rather generalizations of facts. His first law is as follows: The quantities of substances which come into play in physiologic reaction are often in such minute proportion that they may be called imponderable. In spite of the fact that the finest balances can weigh with exactitude

(3) Brit. Med. Jour., Oct. 1, 1910.

not less than the tenth part of a milligram and although by solution we may get the millionth part of a milligram in a cubic centimeter, no chemical re-agent however sensitive can reveal the presence of this infinitely minute amount. Nevertheless, certain physiologic reactions allow us to demonstrate the action of these prodigiously diluted substances. Thus by the difference in the quantities of acid contained in two fermentive liquids such as milk, it has been possible to determine that quantities of metallic salts corresponding to the frightfully small dose of the ten-millionth of a milligram per litre (in the case of the vanadium salts, for instance) were not without some effect on the lactic fermentation. The extreme sensitiveness of the olfactory nerve affords another example of the action of infinitesimal substances. The quantities of iodin found in the blood are so small that they cannot be measured. Often, even, one cannot detect any trace, and nevertheless, this iodin which is found in imponderable proportions in the blood may be —perhaps by the thyroid body—separated, isolated, accumulated, so that there is an iodin combination in the gland. Other experiments of a similar character show the activity of infinitesimal quantities of matter.

From these examples Richet points out that there is possible a physiology of the individual; that while physiology has heretofore contented itself with the study of the species, it must be recognized that no two individuals are alike, either psychologically or physiologically. The psychologic differences of personality and of individual character have long been recognized, and in like manner it is seen how by the action of these imponderable substances the system of one individual may differ from that of another by the difference in the inherited constitution, and also by the impress which the different experiences of infection and toxin has left in the organism. The substances which are active in the life of the individual are not only imponderable but they are so unstable that they cannot be separated from the body fluids. Physiology, therefore, is not only the science of the imponderable but also of the unstable.

Richet illustrates the possibilities of the action of such

unstable substances, and shows that it is not necessary to explain the influence of nerves on secretion, for instance, by tracing the nerve structure to the secreting cells, but that it may be by a wonderful concatenation, the nervous system acting at every moment on the chemical constitution of our humors, just as the chemical constitution of our humors reacts each instant on the nervous system. But in the case of the nerves, as in the case of the humors, it is chemistry that governs all. The living being is a chemical mechanism, and perhaps it is nothing more.

Dutch Folk Medicine. *Surgical Diseases.* M. A. Van Andel[4] describes a number of curious customs and superstitions of the Dutch in the treatment of wounds. The conviction that many substances have a remarkable power in healing wounds is notable in popular medicine. A new wound is covered with cobweb in order to stop the bleeding, a method which, the author says, really seems to have such an effect. He quotes Dioscorides and Pliny with reference to the use of it in ancient times. The popular recipe book of Albertus Magnus recommends it, and the frequency of its former use is evident from the passage of the *Midsummer Night's Dream,* wherein the weaver says to the elf Cobweb: "I shall desire you of more acquaintance, good master Cobweb; if I cut in my finger, I shall make bold with you."

Equally known are the healing powers of the plantain leaf. One must put the front side of the leaf on the wound and it will cure it; the back side, on the contrary, acts as a vesicatory. The use of mud and earth is also quite common. It is easy to understand that the cool mud will give an agreeable sensation to the painful spot, yet this seems not to be the only reason why it is applied. Isäger relates that the peasants of Denmark have the same custom, and try to cure whitlow by sometimes putting the sick finger in the ground. The belief seems to be that the earth will take up the evil and so will promote recovery. The author also refers to the bringing of a sick child at sunset to a new-plowed field and covering it a moment with mould. According to

(4) Janus, April, 1911.

Magnus the fundamental idea of this method is that the earth swallows all that has died and perished, and so will equally be able to receive the illness that has taken possession of a person. The custom of burying the dirty bandage which is practiced everywhere probably depends on a like opinion.

Covering a fresh wound with well-chewed grass or with spittle, or by the licking of a dog is noted. This form of treatment of wounds is to be found in *Luke XVI*, 21-22, and at present various people still attribute great powers to it. Isäger also refers to the custom of covering a wound with spittle and supposes that the intention of it is to keep off the influence of evil spirits. In Jutland the peasants used to spit thrice before sitting down in the grass or before drinking running water, and they did the same when they intended to take up from the ground something which might be dangerous. The natives of the East Indies apply spittle with the intention of fortifying the sick person by communicating to him part of the spirit of another contained in the spittle. For this reason they attribute a high power to spittle of holy and mighty persons. The Dajak women also spit on their babies daily with the intention of adding some of their own spirit. Urine is also sometimes applied to wounds, perhaps with the same intention.

The fat of dogs, cats, hares and pikes, a common ingredient in ointments, is still often asked for; that of the two last animals is thought to be able to extract splinters, an opinion which may also be found in the "*Parnassus Medicinalis Illustratus.*"

Tobacco was frequently used formerly as a remedy for all sorts of wounds, inflammations and diseases of the skin. Von Beverwijck (1663) even attributes such extraordinary powers to that plant that he thinks it cures superficial wounds in one day only. A considerable number of other plants are used. A wound caused by stinging is covered by a split garden bean in order to stop the bleeding. Other styptics are green rye or the scrapings of a felt hat, which will probably have a similar effect to penghawar djambi. In the 17th century it was recommended to scrape the horn of a cow or a bull

and put that powder in the wound. A last remedy for stopping a violent bleeding consists in holding the injured extremity in the warm paunch of a new-killed cow, a therapeutic measure which the folk also use in other such cases.

A very curious method of treating a wound is by means of the "Powder of Sympathy." There are two ways in which this is used: First, the healer will receive a little rag with the blood of some wounded person, on which he strews some sympathy powder (pulvis ferrosseus exsiccatus) and puts it in his pocket, where it will remain until the wound is healed. When he takes care that the little rag does not cool, the cure of the wound will be prosperous. If, on the contrary, he happens to put it on a cold place, as on a pavement, the sufferer will immediately have a reaction of the wound which will become more painful and inflamed. The second method is called: *"In de pint don"* (to put in the pint), and consists in putting a rag with blood and powder of sympathy in a pint measure with luke-warm water. If the healer takes care that the water keeps nearly the same degree of warmth the wound will soon be cured; if he does not, the patient will meet with the same unlucky event. This method seems to have been applied by Sir Kenelm Bigby, an English nobleman of the court of Charles I. He pretended to have learned it from a Carmelite friar who had learned it in the Orient. The explanation of this method as given by Sir Kenelm Bigby is briefly the following: Each body exhales a large number of particles, called atoms. So not only the wound but also the blood on the garter sends a great number of such atoms into the surrounding air. As there is a great affinity or sympathy, as he calls it, between the wound and the blood originating from it, the atoms exhaled from the bloody garter will be attracted by the wound and will transport to it the healing powers of the vitriol-powder with which they have been in connection.

Another method of sympathetic treatment practiced nowadays is the following: When one has cut himself with a knife he must put that weapon in sweet oil or

lard. A nail with which a person has hurt himself is treated in the same manner. In former centuries this method was largely applied, only instead of lard or oil, a sort of salve composed of a large number of ingredients was used. Von Beverwijck gives a prescription for such a "weapon salve," which was invented by Paracelsus. It consisted of: Usnea, being moss grown on the skull of a hanged man, human blood, fat, mummy, linseed oil, turpentine, and bolus.

J. Finlayson communicates the following scenes from Dryden's *Enchanted Island* based on Shakespeare's *Tempest,* relative to this manner of curing:

Ariël. "Anoint the sword, which pierced him, with this weapon-salve.
And wrap it close from air, till I have time
To visit him again." (Act V. 1.)

and:

Mir. "I am come to ease you." (*She unwraps the sword.*)
Hip. "Alas! I feel the cold air come to me;
My wound shoots worse than ever." (*She wipes and anoints the sword.*)
Mir. "Does it still grieve you?"
Hip. "Now methinks, there's something
Laid just upon it."
Mir. "Do you find no ease?"
Hip. "Yes, yes, upon the sudden, all the pain
Is leaving me: Sweet heaven, how I am eased."
(Act V. 2.)

Bites and Stings. The sting of an insect is treated immediately by holding a knife or a key against the injured spot, by putting a dock-leaf upon it, by rubbing it with leek or with half an onion or by smearing ear-wax on it. Bites of snakes were formerly treated with the same remedy. Pliny considers the human ear-wax as a potent remedy in such cases. This substance is advised in the same manner in an Anglo-Saxon remedy of the tenth century, only the power of it is increased by the saying of a prayer. "For stroke of viper, remove from thine ears the wax and smear around therewith

and say thrice the prayer of St. John." Spittle has a great reputation and is recommended by Pliny and Albertus Magnus. Another remedy by which the Dutch people try to cure such a bite consists in smearing the wound with oil wherein an adder is cooked, or by placing upon it a piece of snake's skin cooked in milk. The last remedy is also taken internally. All sorts of people treat the wounds caused by that reptile in analogous manners. In England the viper that has bitten is killed and held on the wound. In Denmark the head of an adder is applied in the same manner, and in the Pfalz dried and powdered adder's flesh is strewn in such a wound. The brass serpent of Moses may be referred to, and in later centuries the reptile was administered as a cardinal ingredient of the remedy which was applied not only against the bites of snakes but also against all sorts of venoms and infections. Parts of the snake, however, were equally administered, as the *Parnassus Medicinalis* tells:

"Man pfleget auch die Gall auf Schlangenbiss zu legen. Sie zieht das Gift heraus, man brauchet sie deswegen."

The bites of other animals are treated in the same way by the flesh of the animal. The method of treating the wounds caused by an animal, by that animal itself is known all over the world. The oil of scorpions was originally used against the stings of that animal, and was later considered as an antidote against all sorts of venomous bites. This remedy is still believed in by the natives of Java. The treating of a dog's bite by putting some of its hairs in the wound, a remedy belonging to the same category, is not limited to Holland. Isäger relates that he has often been a witness of such a cure, and there are several other countries of Europe, Russia, Germany and France, where the folk apply the same remedy. It is recommended by Pliny, and can also be found in a German manuscript of the 16th century.

Stinging nettles in white wine are a remedy for the bite of a dog found in Pliny. The petals of the dog-rose form another vegetable remedy which is locally applied.

This plant is recommended by the medieval Dutch poet Von Maerlant with the following words:

"Ende bijt di een hond verwoet,
Die wortel van der wilder rose,
Saldi ghenesen van der nose."

(And when you are bitten by an enraged dog, the root of the wild rose will heal you from that injury.) A similar remedy which is applied in a dog's bite consists of pounded egg shells and oil of roses. The cure of hydrophobia is no longer known with the folk of today. No earlier than fifty years ago, however, the dipping in the sea of man and animal who were bitten with a mad dog was frequently in use.

Burns. The most simple manner to cure a burn consists in holding immediately the injured extremity as near as possible to the fire or the object which has caused the burn. This method is called in France, "brûler la brûlure." Jacob Cats, a very popular Dutch poet of the 17th century, gives a sane advice, saying:

"Zijt ghy verbrant
Aen voet of hant
Gae tot de vlam,
Daer 't quaet of quam."

Digby gives the following explanation of this treatment: When a man, who has burnt his hand, holds it for some time close to the fire, the fiery atoms, parting from both spots, will mix together. Those of the fire, however, being stronger, will attract and carry off those of the hand and in that way the hand will feel great relief. The greater part of the remedies, which are locally applied in case of burns protect the wound from the air and have an anodyne influence in that way.

Erysipelas. Among remedies for erysipelas are yarn and linen wetted in the blood of a hare shot on the first Friday of March. The blood of a black cat is considered a remedy for erysipelas of the face. The following means are sympathetic, and depend on a conformity in color, such as red cabbage leaves or the petals of red roses; or in sensation, as making a fire-stone sparkle

against it. Isäger relates that in Denmark the last method was used to cure diseases of the skin, causing the sensation of burning, and thinks this custom to be the last remainder of a primitive fire worship. In several agricultural practices in that country the fire also acted the part of a protective power. That such a practice formerly may have been a religious one may be deduced from the Bavarian custom, that a chaste youth or maiden only can perform such a cure. (Chastity is often a necessary condition for the performance of religious ceremonies.) Erysipelas in the face is often treated with bathing it with wine from the Lord's supper. Keeping a turtle-dove in one's room is a very common form of treating this affection. The same means is known in Germany and is thus explained by Lämmert: "The feet of that bird will grow red after some time, therefore they suppose the disease to have passed on it." An eel-skin stripped from that fish is worn about the head as a remedy for erysipelas of the face.

INSURANCE.

State Insurance. J. H. Keay[5] discusses the question of the best provision for treatment of the poor, and expresses his opinion that the best remedy is state insurance. State insurance has been in force in Germany for more than a quarter of a century. We can now study it in all its details. No one can claim that it has as yet proved an unlimited success, but the author contends that as regards medical attendance it goes farther to remedy the defects which have been complained of than previous proposals. The Poor Law Commission states that district medical officers are poorly paid; that their attendance is perfunctory; that they cannot afford to give the medicine required; and that the poorer classes have often great difficulty in procuring medical attendance; that much of the attendance given is unsatisfactory; that there is overlapping; and that too little is done for the prevention of disease.

(5) Brit. Med. Jour., Sept. 17, 1910.

The author discusses various methods at present available for rendering medical aid, among which he includes the following:

1. *Private Practice.* This system still holds good to a large extent among the working classes in the north of England and Scotland, and to a considerable extent in rural districts generally. Were it practicable there are probably few medical men who would not say that it is after all the best. Unfortunately it is not always practicable. The author mentions a district containing about 7,000 inhabitants in which medical charges for advice and medicine are only six-pence and yet he finds that a large porportion of the people are unable to pay even this small sum. He calls attention to the fact that conditions are being rapidly equalized throughout the country, so that it seems not unreasonable to anticipate that private practice among the working classes may by-and-by become a thing of the past.

2. *Voluntary Insurance.* Voluntary insurance by means of clubs, friendly societies, provident dispensaries, etc., has been to a considerable extent successful, but at the same time it is evident that there is a large body of poorly paid workers who do not profit by voluntary insurance, and little is done even for the skilled artisan who through family circumstances, seasonal or bad trade, is unable to continue his subscriptions.

3. *Charity through the Medium of Hospitals, Medical Missions, etc.* In this way many of the poor are provided for, but the author notes the serious abuses to which the method is liable. He mentions the case of the woman who was attending no less than six hospitals and taking medicine from each. He says: "We have thus seen that while in some parts of the country private practice meets the necessities of the case, in others it has utterly failed; that voluntary assurance provides only for a certain section of the community, and that charity has developed in a manner prejudicial to the medical men and to the country at large."

4. *Compulsory Insurance.* The author believes that in many respects the present situation in England resembles that which existed in Germany before compul-

sory insurance was introduced. There has been a gradual exodus from the rural districts, where the landlord or employer often paid for medical attendance, into industrial centers where it was seldom that any provision was made. That voluntary insurance has done something is evident from the fact that some years before the compulsory bill was passed there were over 5,000 clubs or friendly societies in Germany with a membership of nearly 1,000,000. There were hospitals, but on a much smaller scale than in this country. In this situation compulsory insurance was adopted and has proved a considerable success. There is, however, a great deal of difficulty in adjusting the relations of physicians and the insurance societies. Strikes and local quarrels are not infrequent. The new law has extended the limit of income for which the recipient shall be eligible to the state insurance, so that it will include a very large proportion, sometimes as high as 90 per cent. of the population. The author describes his investigations of the situation in Germany and states: "One thing I noted—that when the dispute between the doctors and the insurance societies was mentioned there was hardly any one who could discuss it dispassionately. For example, when the rate of payment was referred to, I was told by insurance officials that the doctors were extortioners; that they were plundering the poor; that in no other trade or profession was it possible for a man to make $2,500 or $3,000 within the first few years. On the other hand, the doctors say it is scarcely possible to eke out an existence, and quite impossible to make adequate provision for wives and families."

The truth seems to lie between the two extremes. In Great Britain there is no means of precisely estimating the average income of medical men. In some parts of Germany it seems possible to make a more precise estimate, as statements have been published giving the amount on which income tax is paid. Statistics from Schleswig-Holstein, in which there are practically no large towns, and where the inhabitants are mostly occupied in agriculture, navigation, and fishing, show the

following amounts on which income tax is paid by the 603 medical men in ordinary practice:

Under £200	28 per cent.
From £200 to £300	22 per cent.
From £300 to £400	20 per cent.
From £400 to £500	13 per cent.
From £500 to £750	12 per cent.
From £750 to £1,000	3 per cent.
From £1,000 to £1,700	2 per cent. and one over.

"When we thus find," says Keay, "that 70 per cent. have a net income of less than £400, we may probably take it that the average income in a similar district in England is somewhat higher. But in judging this matter we must take into account the fact that life in Germany is simpler, and that not so much is expected by patients in the way of expensive motor cars and other kinds of expenditure not absolutely necessary. And, further, we must note the steady increase of fees under state insurance. In Hamburg, for example, the amounts paid by each member of this municipal insurance society for medical attendance (medicine not included) in 1895 was 2s. 5d. In 1909 it was 7s. In all towns there has been a steady increase."

The author regards the German system of state insurance, while not perfect, as a step in the right direction. He believes that a flexible compromise would be preferable to a perfect system. Viewing the matter in this light, he enumerates the following general principles in state insurance for which he contends and which he believes, if wisely adapted, would solve all difficulties.

1. Compulsion. He cites other instances in which compulsory measures are adopted, as for instance, in the school system, and claims that because this matter can be better managed by the state than by individuals it should be compulsory. He calls attention to the fact that medical men are compelled to do certain things, and that there is no reason why there should not be a law to compel men earning good incomes to make provision or pay for medical attendance.

2. Another main principle is that, in order to insure adequate medical attendance being given, assistance is required from the employer and the state. The author thinks that the state has already recognized its obligation and has expended large sums on the public health. Board, lodging, and medical attendance are provided free of charge, not only for the poor, but for the rich when they are suffering from infectious disease. There has been little limit to expenditure in that direction. He asks, "Is it due to the remissness of general practitioners that hitherto, apart from the Poor Law, the state has done nothing in the way of providing medical attendance for the hundreds of thousands who suffer from non-infectious disease and who cannot afford to call in a doctor?" He believes that employers will be willing to contribute to the provision for medical care for their employees on the principle that they will have then less to pay as a poor rate, and that whatever plan is adopted they will be obliged to contribute a portion.

3. If state insurance is adopted in England, Keay insists that one thing should be seriously contended for, namely, the independence of the medical profession. He thinks there is danger, if the plans of some are adopted, that medical men will become the servants of county and borough councils. There would be danger that the profession would be lowered by a political or other wire-pulling for the purpose of gaining appointments or promotion. Further, if the state insurance passed, the danger is that medical men might become even more than at present the servants of clubs and friendly societies. Under state insurance the freedom of medical men may be as great as in private practice. This has always existed in some parts of Germany; in others it has not, and now there is the determination to fight for it. The determination of fees and of the method of payment are matters which can be arranged. The author urges that we must hold our own and support our members, if they say on what conditions they are willing to hold their appointments. Trade unionism is foreign to the spirit of our profession, and it is hoped that strikes, such as have occurred in Germany, will be avoided. However,

the author says: "In any case, I hold that all advantages that might accrue through state insurance or otherwise would be dearly bought if the medical profession in this country were to lose its independence."

4. State insurance has for its object not only the treatment but the prevention of disease. For the prevention of disease it is essential that there be no difficulty in obtaining treatment. As every member of a state insurance society is entitled to attendance and medicine free of charge, there is no temptation to delay till a disease has passed its earliest stage. Nor is there, as in Great Britain, any difficulty or delay in entering the hospital, sanatorium, or convalescent home. In the annual report just published of the Leipzig Municipal Sick Insurance Society, one finds numerous illustrations, constituting quite a work of art, of the institutions provided by the society and private individuals.

The author gives the following testimony as to the success of this method of dealing with disease among the poor in Germany: "I do not think it can possibly be denied that in recent years a great advance has been made in the prevention of disease and in sanitation in the large towns in Germany, though progress has been but slow in many country villages. State insurance, working hand-in-hand with the public health system, has been making a determined fight against tuberculosis. A vigorous campaign is now being initiated against alcoholism and sexual disease. It is quite true that one seldom sees a man the worse for drink in Germany. At the same time it is becoming more fully recognized that the drinking of enormous quantities of light beer and coarse spirits are undermining the physique of the nation. They further claim that their mode of dealing with the prevention of disease is more practical than in England. Why, I was asked, have the English people been spending millions of pounds in an endeavour to stamp out scarlet fever, when they might have seen long ago that the measures they have adopted were utterly unpractical?"

A National Medical Service. Dundas[6] discusses the

(6) Edinburgh Med. Jour., April, 1911.

factors tending to nationalize medical service in Great Britain. The first is the agitation for Poor Law reform and invalidity insurance, and the second is the lately established scheme for the medical inspection of school children. The inspection of school children has shown that a large percentage suffer from defects of various kinds, the greater proportion of whom receive at the most very inadequate treatment. The treatment of school children will be an enormous task.

"No sufficient assessment of results has yet been made. When it is, it will only serve to emphasize the gigantic nature of the task, and that the efforts so far made to cope with it are tentative, experimental and puny. In the mere matter of teeth alone it has been stated that there are not enough dentists in the country to deal with the school children, over 90 per cent. of whom reveal, when inspected by a dentist, a need for treatment. It will then be seen that this is no task for charity or for an education committee, even if it were assisted by grants from the Imperial Exchequer. Committees already groaning under heavy financial burdens, and with ample work of other kinds more truly pertaining to them, would welcome the transfer of this task to the state. We conclude, then, that the duty of treating the children found defective is too great to be shouldered by any but the state.

"But the state may be forced to take up this task. We have heard lately of hospitals refusing to treat school children. If this attitude became general, medical inspection of school children would be rendered useless, for the children cannot afford to obtain treatment elsewhere, and the treatment they require is specialist treatment to an extraordinary degree. That this attitude on the part of the hospitals or at least of their medical staffs should become general is very probable and only right. It cannot be expected that the medical profession will submit to being exploited any longer for the public benefit. It cannot accept the position of being charitable to the state, of undertaking what is coming to be recognized as the state's work. The medical profession then may force the state to undertake the task of amelioration of defective children.

"Assuming that the state does undertake the duty, will it not at the same time undertake the treatment of all who cannot afford the luxury of a private medical practitioner at the standard rate of fees, in short of all whose incomes do not touch the minimum income tax limit?"

Work in this line is showing that specialists working full time give the best results. Treatment of the poor must be along the same lines. If not at first, certainly later, the county medical service will have a whole-time staff. Furthermore, a large medical staff would be required, for many who now go without medical treatment would require to receive it. But the size of the staff would vary with the scope of the scheme. It might be that the services of the county officers would be confined to paupers and school children, or it might be extended to include that large class for whom sickness and invalidity insurance is intended, *i. e.*, all those whose incomes are under £160 per annum; in the event of which the wholesale conversion of the medical profession into a civil service would be involved, and private practice as now known would persist only in the west ends of large towns and in popular rural residential resorts. Under the county scheme the sick will actually be treated by the best skill available, and a medical man will no longer be expected to be competent to deal with all the disorders of the human body. An immediate raising of the standard of practice and rapid advances in knowledge would ensue, but voluntary hospitals would be doomed.

The county medical officer's duty would be to co-ordinate the work done in all the fields of public medical effort, including, as they would, sanitation, school inspection, and the treatment in hospitals, infirmaries, and at their homes of a large section of the population.

Dundas believes that such a scheme would be best administered by a centralized national organization which would co-ordinate all departments and direct the efforts of all members of the force to secure the best results.

MEDICO-LEGAL QUESTIONS.

Legal Obligations of Physicians. Hon. Jos. I. Greene[7] makes some observations on the obligations of physicians and quotes the following account of the law regarding malpractice:

"The law relating to malpractice is simple and well settled, although not always easy of application. A physician and surgeon, by taking charge of a case, impliedly represents that he possesses, and the law places upon him the duty of possessing, that reasonable degree of learning and skill that is ordinarily possessed by physicians and surgeons in the locality where he practices, and which is ordinarily regarded by those conversant with the employment as necessary to qualify him to engage in the business of practicing medicine and surgery. Upon consenting to treat a patient, it becomes his duty to use reasonable care and diligence in the exercise of his skill, and the application of his learning to accomplish the purpose for which he was employed. He is under the further obligation to use his best judgment in exercising his skill, and applying his knowledge. The law holds him liable for any injury to his patient, resulting from want of the requisite knowledge and skill, or the omission to exercise reasonable care or the failure to use his best judgment. The rule in relation to learning and skill does not require the surgeon to possess that extraordinary learning and skill which belong only to a few men of rare endowments, but such as is possessed by the average member of the medical profession in good standing. Still, he is bound to keep abreast of the times and a departure from approved methods in general use if it injures the patient will render him liable, however good his intentions may have been; the rule of reasonable care and diligence does not require the exercise of the highest possible degree of care, and to render a physician and surgeon liable, it is not enough that there has been a less degree of care than some other medical man might have shown, or less than even he himself might have bestowed, but there

(7) Amer. Medicine, February, 1911.

must be a want of ordinary and reasonable care, leading to a bad result. This includes not only the diagnosis and treatment, but also the giving of proper instructions to his patient in relation to conduct, exercise and the use of an injured limb. The rule requiring him to use his best judgment does not hold him liable for a mere error of judgment providing he does what he thinks is best after careful examination. His implied engagement with his patient does not guarantee a good result but he promises by implication to use the skill and learning of the average physician, to exercise reasonable care and to exert his best judgment in the effort to bring about a good result.

"The physician may be charged, however, with negligence predicated upon the conduct of the physician or surgeon in doing or performing an act upon a patient which is contrary to the best or established practice of qualified surgeons, in the treatment of such a case under similar circumstances."

He also cites the following provision of law which allows hospital physicians to appear before a referee to give testimony instead of attending court.

"According to Section 836 of the Code of Civil Procedure of the State of New York, the following provision is made: "In an action for the recovery of damages for a personal injury the testimony of a physician or surgeon, or of a professional or registered nurse, attached to any hospital, dispensary or other charitable institution, as to information which he acquired in attending a patient in a professional capacity, at such hospital, dispensary or other charitable institution, shall be taken before a referee appointed by a judge of the court in which such action is pending, provided, however that any judge may at any time in his discretion order that a subpœna issue, notwithstanding such deposition be taken."

Another source of much doubt arises as to the admissibility of the statements of injured persons to physicians and surgeons as to their sufferings from pain during treatment and the attendance of the physician. It is the well settled law of this state (New York),

though not generally known or well understood, that such expressions of pain are clearly competent, and the doctor may describe to the jury the expression of pain of the patients, as well as the objective symptoms observed by him. As was said by the Court of Appeals, "Screaming or some similar exclamation is the natural language of pain in all man and in animals as well. Evidence may be given that a person appeared to be in great agony, was emaciated, looked haggard and feeble, and why not that he screamed from pain? However, whether such exclamations were real or feigned is always to be determined by the jury." And so too may be offered in evidence the absence of such exclamations with other appearances as a circumstance bearing upon the question of suffering.

The Physician in Court. Lincoln R. Graham,[8] in answer to the question of "How do you testify, Doctor?" answers: "I testify to my physical findings as facts, I testify to my conclusions based with reasonable certainty upon my physical findings."

The physician should report to the patient's attorney, and Graham uses the following form for this report:

The divisions are: Patient's allegations; physical findings; and bill of particulars.

Under the head of patient's allegations the data consists of simply what we would term, the history of the case.

Under the head of physical findings, the data consists of the facts our eyes, ears, touch, smell and even taste may reveal to us; not our conclusions, but the facts that prompt these conclusions.

Under the head of bill of particulars, the data consists of conclusions or diagnosis based upon the patient's allegations and on our physical findings. These conclusions should not only contain a description of the nature of the injury, but also the manner and extent of its effects upon the patient as to its duration, curability or permanency.

In the field of expert testimony, the physician must discriminate very carefully between the subjective or

(8) Amer. Medicine, January, 1911.

hearsay evidence and physical facts; and, in so far as is possible, he must exclude all hearsay testimony, and when unable to arrive at a conclusion without the subjective symptoms, he must testify that he is taking the subjective or hearsay evidence into consideration, and then it is a question of the ruling of the presiding judge whether the testimony will be admissible or not.

The author advises the following method of procedure: After the physician has qualified, the counsellor states: "Doctor, the plaintiff has testified, etc. (stating all her subjective symptoms). When you answer my questions I want you to have in your mind and consideration the assumption, that these facts she has testified to are true, and to base and guide your answers upon this assumption." While the testimony based upon such assumption is not of the weight that it would be if based solely upon physical findings, yet it is the best evidence that can be given with reasonable certainty under these circumstances, and it puts more boldly to the court the consideration of the plaintiff's veracity. The physician should be modest regarding his qualifications.

In all cases of accident or injury, examine the whole body, and where modesty does not absolutely prevent, strip the patient nude. Thoroughness of detail is the one salvation of the physician on the witness stand. After the patient has stripped, observe him standing, walking, his backward movement, his forward and his side movement, the appearance of his skin, his muscles; and if there be any bony or muscular deformity, get out your steel tape measure and compare it with the opposite side. Never use a linen or paper tape measure, for the fact that these may be stretched, destroys the weight of your testimony. Exhaust every possible means to arrive as near to positive certainty as possible; for instance, in the case of an abortion following an injury, go thoroughly over the glandular system and have a Wassermann test done in your presence or do it yourself to eliminate the question of syphilis, for probably the first cross-question put to you would be, "Doctor, has this plaintiff syphilis?"

Graham believes it to be of decided advantage to take some standard medical work that coincides with the method of treatment used into court with one. Upon direct examination stick closely to your physical findings. State what you did and observed—avoid what you said or heard except in that your hearing was a physical sign. You may testify that the patient had the moan of pain; the facial expression of agony, the pallor of shock, the deep lasting groan of labor, but you cannot testify that the patient complained of pain or had pain, for these are subjective symptoms or hearsay testimony.

A good rule to follow is to state where the examination was made, whether the patient at the time of the examination was in bed, on a couch or chair, bleeding, conscious, shocked, the location, the nature of the physical findings, discolorations, swellings, luxations, bony deformities and separations, also what you did and how you did it and when you have gone this far, *stop*.

Do not take anything for granted, and while your answers should be brief, make them complete so that there are no omissions that offer opportunity for the opposing attorney to humiliate you, by displaying your laxity. Do not be too scientific in your answers. Rather condense your knowledge to simple facts and express them in simple terms.

Expert Testimony. A report on this subject was submitted to the International Congress of Legal Medicine,[9] in 1910, and the following conclusions were adopted by the congress: The Third International Congress of Legal Medicine, meeting at Brussels, declares its adhesion to the principle of a duality of experts, the one being appointed by the prosecution, and the other by the defense. In its judgment the expert testimony should be arranged in a manner to insure perfect legal equality between the expert of the prosecution and of the defense, with recourse to an arbiter in case of disagreement between the experts.

The Power of Locomotion in Severely Wounded Persons. Th. Lochte [1] reports a number of cases illus-

(9) Prog. Méd., Sept. 24, 1910.
(1) Wien. med. Wochenschr., Apr. 8, 1911.

trating the power of persons severely wounded to maintain an upright position and to move for certain distances. Even from the injury of the internal organs of the chest and abdomen by blunt force the power of action is not entirely abolished. As an example, Lochte cites the following: A 19-year-old boy received a kick and fell to the ground, but immediately arose, hurried into the stall and fell dead. Externally there was no injury. There was a transverse fracture of the sternum 4½ inches above the articulation with the xiphoid cartilage. There was no blood in the thorax. The pericardium was uninjured, but was so filled with blood and serum that it compressed both lungs. There was a rupture of the right auricle 1½ inches long. Above the ostium venosum there was a transverse fissure 1½ inches long. A third fissure was found in the membrane of the foramen ovale. There were still other internal lesions.

The following illustrates the power to act after a gunshot wound of the skull: A 19-year-old powerful young man shot himself in June, 1881, with a revolver of small calibre, sending a bullet into the right temple. The bullet remained to the left of the boundary between the anterior and middle fossa of the skull. The patient recovered. In answer to the question as to whether immediately after this shot he would have been able to fire another, he answered as follows, "I never lost consciousness entirely for I immediately recognized and saw the persons who came into my room, even when I fell on the floor. Immediately after the shock I felt my head very heavy and my ears rang loudly, but I had no headache. I fell to the floor and was a little stunned, but I had my senses and I knew perfectly well what I was doing. I would not have been able immediately to have fired a second shot, for with the first my revolver fell from my hand, but I believe that a minute after I would have been perfectly able to do it. I believe, indeed, that had I not drank a little too much I would have been able to rise entirely without help."

Lühe relates having read the discussion in American papers of a noted case in which the question was raised: Can a man with a serious gunshot wound of the heart

live for several minutes, during which he may walk several steps and wound another man? The following case is reported: A farmer was killed close to his farmyard and the self-wounded man who was suspected of the deed, claimed that he had been attacked from behind by the dead man and that, as a matter of self defense, he had shot him over the hips. The relatives of the dead man stated just the opposite; *viz.:* that the murdered man had been quietly working when the fatal shot struck him, but afterwards had gone to his loaded gun about twenty steps away and had shot at his enemy and then sunk down dead. Although the possibility of such an occurrence was denied by many experts, it was finally admitted, after considering all the circumstances, that in spite of the considerable wound of the heart and the great loss of blood, it might have been possible.

G. Fischer reports two cases in one of which a man with a wound through the heart, the diphraghm, the left lobe of the liver, the spleen, and the large intestine, made with a concave sabre, could still walk ten paces. In the second case a soldier who was struck with a bayonet and received, in addition to the injury of the heart, numerous wounds of other organs, walked eight or ten steps before he fell unconscious. The medico-legal man must know that a complete separation of the large veins of the neck is not always immediately fatal.

Traumatic and Accidental Herniæ as They Affect Employee and Employer. R. W. Corwin [2] considers herniæ under the following heads:

1. True traumatic hernia.
2. Accidential hernia with trauma.
3. Accidental hernia without trauma.

True traumatic hernia is always associated with an accident, producing trauma or injury, but without a predisposing cause. The injuries may be received as follows: 1. Force from without, lacerating the tissues from without inward. 2. Force from without, lacerating the tissues from within outward. 3. Force from muscular contraction, lacerating the tissues from within outward. 4. Force from without, the rings intentionally

(2) Amer. Jour. Surg., March, 1911.

stretched to escape army serivce. This is said frequently to happen in Russia.

Corwin recognizes the efficiency of wounds in the action of heavy loads in producing hernia, but says: "The laceration of the muscular walls from lifting or from a sudden jar is rare enough for us to cast reflection on the integrity of the muscular tissues, and in such cases, almost doubt the probability of such occurrences in the normal abdomen. For a viscus to force itself through a healthy abdominal wall by muscular contraction or jar seems well nigh impossible." Corwin has made a number of experiments on animals and on the human cadaver in which he found it very difficult to force his way from within outward through the intact inguinal ring. He concludes, therefore, that the varieties of hernia classed as accidental very rarely occur in a sound person. The result is very different when there is a slight depression at the internal inguinal ring or where there is a congenital weakness, a slight enlargement of the inguinal ring or a preformed sac. We may say then that accidental hernia in the sound body is improbable; and that in an unsound body an accidental hernia may occur, the readiness with which it may occur depending on the abnormality (at the internal ring).

Accidental hernia he divides into two classes: First, accidental hernia with trauma; second, accidental hernia without trauma. The occurrence of an accidental hernia without trauma presupposes that the internal ring is dilated and the sac wide open.

Corwin believes that the laymen should be convinced that hernia is largely avoidable and should be encouraged to enthusiasm in prophylaxis. The employer should instruct the employee as to the best ways of protecting himself. The structure of the abdominal wall should be explained and the reason given for the fact that there is often a place or ring that has little resistance. The employee should understand that corrections made in infancy or childhood are a protection in adult life and old age. The dangers of neglecting hernia should be pointed out, and the employee should be told what should be done in case of hernia, and why it should be done

properly. When the employee understands the risk and the employer appreciates the danger both will see the philosophy of correction and protection.

Professional Diseases. The Second Congress of Professional Diseases met at Brussels, Sept. 9, 1910, and discussed six important questions, each one of them occupying a single session. The first subject of importance was the question of maintaining a distinction between or of classifying in the same category industrial accidents and professional diseases. Almost all nations now admit compensation for industrial accidents, but very few have placed the professional diseases upon the same footing. One difficulty appears at the beginning. If the accident has resulted from work, it is easy to determine it, in consequence of the suddenness with which it occurs, which is involved in the definition. This is not the case with a professional disease which is of necessity of an insidious origin. Gilbert of Brussels, General Medical Inspector of Belgium, made the following statement: "Every disease recognized as particularly frequent in a profession or trade should be considered as a professional disease of the same order as that which is manifestly due to the risks of the trade." Razous, Comptroller of the Department of Labor of Paris, presents a different view: "By professional disease is to be understood one belonging to a profession or group of trades of which one of the causes is to be found in the exercise, more or less prolonged of the trade, and to which persons who are not engaged in such professions or trades are not exposed." Hamaner of Frankfort declared that it is no longer possible to draw a strict line between professional diseases and industrial accidents; legislation on compensation for accidents, especially in Germany, has caused this limit to be quite confused, and he arrived at the conclusion that it was necessary to place accidents and professional diseases on the same footing. Most of the speakers recognize the necessity of forming a list of professional diseases.

Aside from Swiss legislation, which has not been thoroughly enforced, it is necessary to study the results of

(4) Presse Méd., Sept. 28, 1910.

the Workmen's Compensation Act of 1906 in England. This was reviewed by Lagge and J. Collie. The English Act names 24 diseases as proper claims for compensation, among them being lead, mercury, phosphorus and toxic vapor poisonings, nystagmus and certain special affections of miners, subcutaneous infection of the knee, the hand, the neck, cataract, anthrax, ankylostomiasis, and telegraphers cramp. The period of disability must exceed a week and must be certified by the certifying factory surgeon. If the latter refuses to give the certificate, the laborer may make an appeal to the medical referee who makes a definite decision. The employer may also appeal to the same authority. Proof may be required in a contrary sense; thus, if we have to do with a case of lead poisoning, in a laborer working in a factory classified under the title "lead," the burden of proof must rest on the employer to show that the laborer has not been personally exposed to intoxication. If it was an iron mine or one of lead containing coal, the laborer must show that he might have been intoxicated by the presence of products containing lead. The compensation act has received a great deal of criticism on account of evident abuses, and Collie who in his capacity of medical referee has been able to study 1,460 cases in one year, does not hesitate to point out the defects of the law. He insists on the difficulty of detecting malingering which is so often complicated by genuine auto-suggestion. There is, therefore, a necessity that the English law of 1906 which leaves to the judge the task of determining the question of compensation should be modified in such a way that the medical questions in litigation should always be examined and determined by independent authorities, that is to say, by the certifying surgeons and the medical referees.

Teleky of Vienna proposed the following fundamental principles: 1. "Administrative authorities should prepare a list of professional diseases, that is to say, of diseases peculiar to this or that profession. 2. Professional diseases are difficult to recognize when they are mild in the beginning, but all these diseases should be protected by an obligatory insurance until their absence

has been established. 3. Laborers affected with professional diseases should be indemnified as are the victims of accidents. The English system of a certifying surgeon is to be recommended."

Miners Hygiene. Delbastaille gave the following statement of requirements for suppressing ankylostomiasis. The campaign against ankylostomiasis requires, in order to lead it rapidly to a successful termination, combination of general and special hygienic measures, acting on the parasite and on the culture medium; the essential measures are revision, treatment, and examinations. The revision should be periodic and the more frequent in proportion as the mines are more infected and more infectible on account of their physical condition. Examinations of the discharges ought to be obligatory and general, and the treatment should be carried on in establishments for this purpose, dispensaries or hospitals under the direction of experienced physicians. It is important, therefore, in order to secure a strict observation of all the prophylactic measures and the scrupulous execution of the means adopted, that an incessant medical surveillance of the contaminated mines should be exercised. A number of the Belgian physicians whose opinions were represented by Cailleau show a marked tendency to believe rather in curative measures than in prophylactic methods. It must be added, however, that this is not the general opinion. In treatment, thymol or the ethereal extract of male fern is to be recommended.

Lead Poisoning. The early diagnosis of lead poisoning is extremely important, since it permits the patient who has not yet been truly attacked by the poison to be removed. Mellière of Paris insists on the prophylactic importance of early diagnosis and treatment. Together with the digestive tube and its appendages it is the cardiovascular apparatus and the blood which may furnish the best indication for detecting latent saturnism. One may mention, for instance, the modification of the pulse, preceding nephritis and chronic uremia, which are peculiar to lead poisoning and markedly rebellious to all medication. But before these alterations

of the pulse, the blood itself undergoes modification; the red cells with basophilic granules, and the nucleated red cells that are also met in various anemias of toxic origin, show themselves in patients with lead poisoning at a much earlier period, and often indeed before any other symptom is clinically demonstrable. An exaggeration of the resistance of the red blood cells to hemolysis and a marked diminution in number of the cells is observed. Those different determinations which require only a small amount of blood may be easily practiced on subjects in which there is doubt, or which attract attention by symptoms slightly pronounced or contradictory.

It may happen that the physician hesitates to decide on a diagnosis of plumbism on patients who are working in lead only in an irregular fashion. In such cases the practitioner may profit by the determinations that Mellière has made with reference to the localization of lead in the nails, hair and the cast-off skin. As will be seen, a complete clinical examination of the different organs is necessary to enable sanitary physicians to detect with certainty poisoning with lead. In case of doubt or a material impossibility of making a methodic exploration of all the doubtful cases, the practitioner should recommend the latter to carry out regularly certain hygienic and medical prescriptions. In the first place there is the frequent employment of sulphur baths. By its eliminating and revealing action sulphur may often play an efficacious rôle in the therapeutic prophylaxis of plumbism. It is a better plan, moreover, to employ sulphur in all its forms: sulphur baths every eight or ten days, a periodic treatment with sulphurated honey, and a treatment with sulphurated mineral water when this is practicable. The author recommends also a vegetarian diet with the addition of a diet rich in fats which facilitates the resistance of the organism to the intoxication by lead.

The following question was discussed: Is the presence of basophilic granules in the red cells and the nucleated reds, pointed out first by Grawitz and Sabrazes which has been made the object of an important communica-

tion of Glibert at the Milan Congress, really pathognomonic?

Alcock of London does not consider that the examination of the blood can give practical results. Rambonsek could not obtain basophilic granules in the experimental intoxication of rabbits. Sternberg of Vienna also declares that the granulations often cannot be discovered; moreover, he thinks it is preferable to examine the urine and fecal matter for lead. But all authors recognize that an early diagnosis cannot be made by a single symptom, and it is only by a most complete chemico-clinical analysis that lead in its latent state can be detected.

Results of Legal Regulations as to Lead. Lagge of London described the results of the application of the English law requiring the reporting of cases of lead poisoning. In the first table he indicated the number of cases reported each year for a decade and showed that on the whole this number has diminished more than half during that time. This considerable decrease is limited to trades in which as a result of a special ordinance a localized ventilation and a periodical medical examination were required. On the contrary, where it has been recognized as impracticable to require localized ventilation or where there is an absence of periodic medical examination a tendency to an increase in the number of cases of plumbism can be established. The number of deaths attributable to lead poisoning has not followed the decrease of the number of cases of poisoning reported. The author attributes this fact to the tendency, which must be taken into consideration, of lead to hasten the fatal result of other diseases like chronic nephritis. The study of these numerous cases of lead poisoning has convinced the author that nine-tenths of the cases are due to the inhalation of fumes or lead-bearing dust. It is necessary, therefore, to endeavor in all cases to purify the atmosphere from dust and toxic vapors. The object of the medical examination should be to utilize the least sign of the absorption of lead to remedy a dangerous situation. Special attention should be given to new-comers, not simply because they are ignor-

ant of the precautions to be taken, and because they are more receptive to the poison than older workmen, but also because the signs of absorption of lead are so marked among them as to constitute the surest guide for determining the defects in the working processes.

Dr. Alice Hamilton, of Illinois, reported the sanitary condition of lead-workers in the United States, a country where there is no regulation. In some factories 40 per cent. of the force are poisoned; it must be added that the greater number of these workmen of Hungarian or Slavic origin, are very untidy and take no care of their self-preservation.

Buschold, of Berlin, reviewed the statistics of the labor bureaus which have been regularly in service for a long time in Germany. Lead poisoning is by far the most important of the professional intoxications. The statistics of the bureaus show that while the number of cases in which lead poisoning has been diagnosticated has not increased, the affections of the nerves, of the heart and the kidneys are becoming more common among the painters of Berlin. How many times are these diseases due to lead poisoning? Lead poisoning has diminished among typographers, workers in white lead, laborers who make minium, and litharge, because energetc intervention is possible in the permanent factories; it is impracticable in reference to painters whose place of labor is constantly changing.

Previous Condition with Reference to Industrial Accidents. Courtois-Suffit and Fr. Bourgeois[7] report two cases in which a slight accident to tabetic patients led to very serious results, and discuss the relations of the French law to the injuries thus caused by industrial accidents in the case of persons affected with a previous disease which is aggravated by accident. The decisions of the French courts which the authors quote appear to be quite inconsistent in this respect, some of the courts not recognizing the previous condition as affecting the liability or the degree of indemnity for the accident, while others allow this question to affect the amount of indemnity. They conclude as follows: "It

(7) Gaz. des Hôp., June 1, 1911.

results from these investigations that if jurisprudence is no longer uniform on this important question of the previous condition, this is due to the fact that having to determine cases that are completely different with respect to the causal disease and completely different with reference to the degree of the evolution of the disease, and different also with regard to the seat of the trauma, and also with regard to the occupation of the person, the judges cannot always apply a consistent jurisprudence. Moreover, it is impossible, in our opinion, both medically and legally, to adopt as a principle any theory either medical or legal with reference to the previous condition. This is the sort of question which cannot receive an *à priori* solution, and which can be settled only by a profound medical and legal study of each particular case. It is only by the most intimate collaboration between magistrates and physicians that a solution agreeable to the interests of all can be arrived at. The adoption of a fixed legislation in regard to the previous state, besides being as it seems to us at the present time, impossible, or at least very difficult, would be, moreover, in our opinion, often prejudicial to the laborer."

Therapeutic Abortion. M. H. Montal[8] comments on the fact that the French law makes no provision for exemption from punishment for the physician who performs a therapeutic abortion. The French penal code is as follows: "Whoever by food, drink, medicine, violence, or by any other means shall have secured the abortion of a pregnant woman, whether with or without her consent, shall be punished by imprisonment. Physicians, surgeons, and other officers of health, as well as pharmacists, who shall have indicated or administered these means shall be condemned to punishment of forced labor in cases in which the abortion shall have taken place."

The author believes that the absence of criminal motive would lead the courts in any case to suspend punishment or acquit a physician in case of abortion undertaken to save the life of the mother. It would be preferable, however, he says, that the text of the law should

(8) Presse Méd., Mar. 25, 1911.

decide the question, and give every assurance to physicians whom the conscientious exercise of their calling may oblige to provoke an abortion. He calls attention to the fact that in the revision of the penal code proposed in 1910, the question of therapeutic abortion is not considered, but merely the penalties are lessened. This lack should be supplied. Until that time physicians will do wisely to consult at first with their colleagues and then to notify the police either before or as soon after the abortion as possible so that the question of criminal intent cannot be raised.

Alcohol and Its Relation to Legal Medicine. M. Keschner[9] discusses the relations of alcohol to legal medicine and gives some statistics of its effect in favoring or producing disease. In Bellevue, for instance, in 1907, out of a total number of 33,224 patients, 6,376 were admitted for alcohlism; in 1904 the total number of patients was 29,741, alcoholic 8,941. Among the alcoholic in these figures, the patients admitted for ailments due to alcohol secondarily such as chronic Bright's disease and cirrhosis of the liver are not included. In the workhouse on Blackwell's Island, out of 17,471 prisoners committed in 1907, 4,728 were committed for being alcoholic. The average mortality is about 10 to every 10,000. This varies in different countries and climates.

Here, then, we have a product, the abuse of which causes a higher morbidity and mortality than any other known or unknown cause. In committing this ravage, alcohol has all the pathogenic bacilli and cocci individually and collectively bowing to it and pronouncing it supreme in destructive power.

Next to heredity, alcohol in 42 per cent. of the cases according to Kraepelin, is the most prolific cause of insanity, idiocy, and epilepsy. Generally speaking 60 per cent. of all crime committed is the result directly or indirectly of alcohol or association with drinking houses. The alcoholic rounder is one of the best culture media for the tubercle bacillus. Moral depravity finds its best friend in whiskey. In the law, the alcoholic is *sui*

(9) N. Y. Med. Jour., Oct. 8, 1910.

generis; it was necessary to establish for him rules of conduct differing from those of ordinary men. His status in the law is as unique as it is on the sidewalk.

Drunkenness itself is no excuse for crime, but insanity which forms a valid defense in other cases, has been held as excusing a criminal although the insanity was originally produced by alcohol. In a case in which the defendant was charged with having stabbed his sister and killed her while he had an attack of delirium tremens, the court said: "Drunkenness is one thing, and the diseases to which drunkenness leads are different things; and if a man by drunkenness brings on a state of disease which causes such a degree of madness, even for a time, as would have relieved him from responsibility if it had been caused in any other way, then he would not be criminally liable. In such a case the man is a madman and is to be treated as such, although his madness is only temporary. If you think he was so insane, that if his insanity had been produced by other causes he would not be responsible for his actions, then the mere fact that it was caused by drunkenness will not prevent it having the effect which otherwise it would have had of excusing him from punishment. Drunkenness is no excuse, but delirium tremens caused by drunkenness may be an excuse if it produces such a state of mind as would otherwise relieve him of responsibility."

Keschner quotes the following sections of the New York Penal Code relating to alcoholism: "No act committed by a person while in a state of voluntary intoxication shall be deemed less criminal by reason of his having been in such condition. But whenever the actual existence of any particular purpose, motive, or intent is a necessary element to constitute a particular species or degree of crime, the jury may take into consideration the fact that the accused was intoxicated at the time in determining the purpose, motive, or intent with which he committed the act.

"A physician or surgeon or person practicing as such who while in a state of intoxication administers a poisonous drug or medicine, or does any other act as a physi-

cian or surgeon, to another person without intending to kill him, but which produces the death of the latter, is guilty of manslaughter in the second degree.

"Any person who, being employed upon any railway, regulating or running trains upon a railroad, or being employed on a vessel propelled by steam, is intoxicated while engaged in the discharge of any such duties is guilty of a misdemeanor.

"An habitual drunkard who abandons, neglects, or refuses to aid in the support of his family is a vagrant.

'A person who has contracted an infectious or other disease while drunk and requires charitable aid to restore him to health is a vagrant."

A person cannot be held to a contract made while drunk, even though the drunkenness was voluntary, except for the value of necessaries furnished.

Wills. The physician is frequently a vital witness in will contracts, where the question of the testamentary capacity of the deceased is involved. The test is about the same as in other mental disabilities: (1) The testator must be shown to have understood the business that he was engaged in; and (2) the testator must have been able *without prompting or assistance* to summon before his mind the property he wishes to dispose of and the persons who are the natural objects of his bounty, and must have been able to retain these in his mind long enough to arrive at a rational conclusion.

A will made during an attack of delirium will be thrown out. To throw out a will of a man who was drunk at the time of making the will, the contestants must prove by medical or lay or both kinds of witnesses, that the testator was so drunk that he did not know what he was doing. If the contestants prove that the testator was an inebriate, the will will be thrown out, as it also will if they can prove that at no time did he know what he was about.

Keschner deplores the lack of attention to alcoholism in this country. He says of New York: "In this State both the public and authorities are woefully indifferent as to the disposition of this unfortunate class of

patients. The only law there exists concerning him is to lodge him in jail. Millions are spent annually to eradicate infectious diseases; great stress is laid on the prevention and treatment of bubonic plague and pellagra; most sumptuous sanatoria are constructed to harbor persons afflicted with the 'white plague'; yet the damage inflicted physically and economically by alcohol is far greater than that inflicted by all the infectious diseases put together.

"Jails, workhouses and penitentiaries in this State cost millions to maintain, and these harbor criminals, 60 per cent. of whom owe their origin in crime to alcohol; yet to the shame of us physicians and citizens of the Empire State we have no provision such as a 'Home for Inebriates' to treat scientifically and intelligently these alcoholics before they become criminals."

Partial Responsibility of Criminals. Matthe [2] discusses the reasons for recognizing a partial responsibility for criminals who have some mental defect insufficient to deprive them of the responsibility of their actions, but sufficient to affect their decisions in regard to right and wrong. He reviews the laws in different countries most of which recognize no gradation between complete responsibility and complete irresponsibility in consequence of well-marked insanity. In Denmark partial responsibility is expressly specified in the law. In Sweden while the letter is lacking the spirit is present. The Cantons of Valais, of Neufchatel and of Tessin recognize a partial responsibility. Although France is preparing a new criminal code, no notice has been taken of this partial responsibility, and no special legislation applicable to those of inferior mental ability is provided.

Matthe has drawn up the following sketch of a law based on the facts exposed in the course of his work:

1. A diminution of mental strength is a cause of the diminution of responsibility.

2. Every accused person has the right to invoke, and may solicit either by himself or by the intermediation of his attorney a medical expert examination. This

(2) Prog. Méd., Sept. 17, 1910.

measure of instruction cannot be refused. It must be granted on his request if it has not been officially ordered by the judge.

3. When the medical examination shall have shown that the accused presents a deficiency in his physical condition sufficient to lessen his responsibility without abolishing it, the judge may, in case of acquittal, order the incarceration of the accused in an asylum for safety, and in case of conviction, may prescribe that his penalty shall be carried out in an asylum prison. This measure shall be ordered by the criminal court or the tribunal which pronounces the acquittal or conviction, and by the same sentence.

4. The recognition of diminished responsibility shall not constitute an extenuating circumstance for the crime. It has an effect only on the execution of the penalty and not on its duration. Always the accused of this category are susceptible only to the penalty of imprisonment.

5. The condemned shall undergo his punishment in the asylum prison. He shall first be incarcerated and submitted to a special treatment appropriate to his condition. He shall fulfill his prison sentence as soon as a cure shall have been obtained. The time spent in the asylum shall be applied on the term of the sentence pronounced.

6. Every serious modification on the psychic condition of the prisoner shall be reported by the director of the asylum prison to the state's attorney. This officer shall appoint three medical experts for the purpose of examining the prisoner and shall pass on the conclusions of their report. If the condemned is considered by them as cured, the state's attorney shall order a cessation of his treatment and a commencement of his punishment. If on the other hand, the prisoner is declared affected with mental alienation the attorney shall order his immediate transfer to an insane asylum.

7. Three months before the expiration of the sentence the director of the asylum prison shall make a report to the president of the civil tribunal. This officer shall appoint three experts who shall separately and

at different times in the course of the last two months of the sentence proceed to examine the prisoner. A prisoner who may be set free may also be examined by a medical expert chosen by himself, and may have this expert's observations presented to the tribunal by his attorney.

8. The prisoner who is declared to be completely cured shall be set free under the conditions mentioned in the following article. A prisoner who is decided by the tribunal to be insufficiently cured and unfit to return to his normal life shall be sent to an asylum for safety and kept there in a state of conditional incarceration. He shall be subjected every two years to a medical examination under the conditions described in Art. 7. He may in the course of this conditional incarceration, either by himself, or by the intermediation of his attorney, ask to be set at liberty, which liberty shall be pronounced by the tribunal only under the form and after the tests for liberation indicated above.

9. The liberated subject is an object of direct surveillance for two years of residence. At the expiration of his first and of the second year he shall be recalled to the asylum and be subjected to a medical examination. If it is recognized that he is definitely cured, he shall enjoy his liberty as any other citizen. If not, he may be required to spend another term in the asylum for safety.

10. The asylum prison and the asylum for safety are under the surveillance of the state's attorney who is the only person competent to determine the changes of condition in the course of execution of the sentence. The civil tribunal of appeal from the asylum is, on the other hand, the only authority competent to determine with regard to liberation at the expiration of the sentence and on its continuation, and on the cessation or reassumption of the conditional incarceration.

11. The internal organization of the asylum prison and of the asylum for safety shall be the object of a decree (Royal or Imperial), or of a regulation of public administration.

The Discharge of Lunatics by Habeas Corpus Pro-

ceedings. F. A. Fenning [3] of the bar of the District of Columbia quotes the following definition of habeas corpus: "The writ of habeas corpus is that legal process which is employed for the summary vindication of the right of personal liberty when illegally restrained." On the basis of this definition he discusses the propriety of the use of this writ for the liberation of insane persons from asylums. Considering that confinement in an asylum is necessary both for the benefit of the patient and of society, he shows that the confinement of an insane person is not an illegal restraint of personal liberty, and therefore the burden of proof that the person is not insane rests on the petitioner of the writ of habeas corpus. This proof should be presented at the time of application for the writ, thus obviating the difficulties and dangers of bringing an insane man into court and allowing him temporary liberties while his case is being tried. In addition, the author shows that writs of habeas corpus are properly to be decided by a judge, and that there is no reason why the right of jury trial should be accorded in such cases. By education and practice the judge is better fitted to decide the probable sanity or insanity of an applicant for this writ than a jury. He quotes the following decision: "There is no provision in the constitution of the United States, neither is there in any State constitution, which gives the right to have these issues of fact tried by a jury in such proceedings. The constitutions, federal and state, provide substantially, that the right of jury trial shall not be violated, but it is not violation of this inestimable privilege to deny it in chancery proceedings, preliminary examinations and proceedings by habeas corpus."

The author suggests that an improvement in this regard will be secured by greater publicity with regard to the management of hospitals for the insane. The practice of inviting physicians and others to examine the hospitals and the attempt on the part of those conducting such institutions to instruct the public regarding the nature and treatment of insanity will eventually

(3) Jour. Amer. Med. Assoc., Feb. 18, 1911.

bring about a saner view of the needs and the rights of the insane, and of the relations of the medical profession to them. Until medical science can cure all mental ills, those who suffer from such affliction must be cared for and directed in ways that are pleasant, but always in paths that do not permit these unfortunates to be of danger to themselves or to their fellows. The great agencies of the law must be wide open to them, but with the limitations that are essential for the proper administration of justice, and the safety of all the people.

SOCIOLOGY.

The Unfit. W. J. H. Sinclair [4] uses the term unfit in a general way, to include the always-tired, the loafer and unemployable, the feeble-minded, the epileptic, the criminal and the alcoholic, excluding the physically unfit, or the certifiably insane. The unfit form a large class of several divisions, and their inefficiency is usually attributable to one or the other of the following causes:

1. Mental defects, either congenital or of later development.
2. Bad environment, including bad example, unsuitable, unhealthy and badly managed homes; defective training and discipline; and absence of religious and moral instruction.
3. Hereditary taint.
4. Alcoholism.
5. Criminal tendency.
6. Disease.

The Always-Tired. Some people are the subjects of a chronic lethargy from which it is usually impossible to rouse them. It is possible that in the case of a few of the always-tired there is a mental condition which renders physical exertion a thing to be avoided, something to be dreaded. A very interesting problem may yet turn out to be the relationship between intestinal toxemia and the statement which is put into the mouth of a British workman. The author quotes from Sir Lauder Brunton, "I eats well, I drinks well, and I sleeps well,

(4) Glasgow Med. Jour., January, 1911.

but, when I sees a bit of work coming along, I'm all of a tremble."

The Unemployable. At the present time there are thousands of persons physically fit who wander about from city to city and from town to town. A considerable proportion of these are mentally defective, but not certifiable under the existing Lunacy Acts.

The Feeble-Minded. The feeble-minded form about 0.5 per cent. of the population. Many of them are not legally committable as insane and are inadequately restrained and protected by law. Under the system at present holding, mentally defective persons falling into the hands of the police pass the bar of the court, and are sentenced. Rarely, if ever, is any evidence as to the mental condition of the prisoner at the bar placed before the magistrate, except in instances where there may have been attempts to commit suicide, or where the conduct of the person at the bar may have appeared to be an attempt at self-destruction.

The feeble-minded are apt to pass from vagabondage through increasingly serious grades of crime to indecent assault, rape, manslaughter, and even murder. They are untidy in their dress and habits, and, although when at large usually of uncertain temper, they are, most of them, under authority, docile and fairly civil. Weak-minded young men are frequently to be found in prison undergoing punishment for indecent exposure, indecent assault, and rape. Those are facts of serious racial and imperial import. The average number of children in a normal family is four; the average number in a degenerate family is seven (Miss Dendy, Charity Organization Review, Aug., 1910).

The Epileptic. The epileptic is, in many respects, peculiarly unfit. The uncontrollable impulse, the limiting effect of the seizures in relation to safe forms of employment, the uncertainty of behavior during the post-epileptic state, and the frequent tendency to progressive nervous instability, all conduce to unfitness. In Scotland, England, and Wales, there are at least 20,000 epileptics not certified as persons of unsound mind, and loose on the community. Epileptics are free to produce their kind and are responsible for bringing into the

world lunatic, weak-minded, and epileptic persons. Dr. Bond, Medical Superintendent of the County of London Colony for Insane Epileptics, regards the marriage of insane epileptics as a social crime and a sin against posterity.

Alcoholism is a frequent cause of unfitness both directly and indirectly, but some persons attach too much importance to heredity in alcoholism. Alcoholism is not rarely a symptom of some deep-seated serious defect. The dipsomaniac or alcoholic who is a drunkard as a result of neuropathic or psychopathic defect has probably inherited such defect, and is likely to transmit it, and his progeny is likely to manifest such inheritance by emotional, volitional, or intellectual defect or any combination of these defects. But most drunkards are drunkards not from inherited defect, but because of lack of self-discipline; and also because of the attitude of the class to which they belong towards drunkenness, and, perhaps more than to any other cause, because of the *habits* of their social stratum. Such people do not transmit such a condition of the nervous system as produces a dipsomaniac, nor are their progeny likely to be mentally defective as a result of the drinking-habits of their parents.

Is Mental Defect Transmissible? On this point apparently something may be said *pro* and *con*. There is, to say the least, great probability that the offspring of parents who are themselves mentally defective are less likely to be of vigorous and well-balanced mental constitution than the offspring of parents who are of normal mental constitution.

A great authority, Dr. Charles Mercier, says "insanity"—and mental defect is the same thing—"is, in mathematical terms, a function of two variables. That is to say, there are two factors, and only two, in its causation, and these factors are complementary. Both enter into the causation of every case of insanity, and the stronger the influence of one factor, the less of the other factor is needed to produce the result. These two factors are, in brief, heredity and stress."

Sinclair summarizes as follows: There is a large and increasing number of unfit people in this country.

The influence of those people while at large is hurtful to the community, leading to the production of undesirable stock and to large public expense. Legislation for the care and control of the unfit in their own interest and in the interest of the race is urgently called for. The physically capable and non-criminal among the unfit would probably be suitably dealt with in farm and labor colonies.

Notification and registration is probably necessary as a preliminary to the proper care and control of epileptics. Much attention should be bestowed on the health and training of epileptic children, when possible by parents, otherwise by the State. The marriage of an epileptic should be prohibited by law. Epileptics improperly cared for by their relatives should be put under care and treatment in epileptic colonies. The shutting up for the natural term of their lives of incorrigible and irresponsible inebriates is highly desirable in their own interests and in the interests of the community. A simple and easy method of finding the feeble-minded such as notification is probably practicable. Legislation to facilitate certification and to provide for the continued confinement of the feeble-minded is urgently required.

Safeguarding Society From the Unfit. A. B. Cooke [5] calls attention to the tendency of degenerates to perpetuate their criminal tendencies in the offspring, and advocates the laws of Indiana touching this question. He shows by statistics that crime and degeneracy are increasing. He quotes the following from a recent issue of *The World To-day:*

"Do you know that our criminals cost us $3,500.00 a a day? Do you know that 250,000 persons—whom the law never touches—are engaged in the systematic pursuit of crime as a business? Do you know that the pickpockets of New York retain the permanent services of one of the best known lawyers in the United States to look after their 'interests'? Do you know that during the past ten years the tramp burglars of this country have almost doubled in number? Do you know that this army of criminals is partly made up of mental de-

(5) Southern Med. Jour.

fectives who might have been placed, as children, in institutions where they would have been trained to lead harmless and perhaps, useful lives?"

To these Cooke adds the following questions: "Do you know that not a single public institution exists in Tennessee or any other Southern state for the care and training of defective children? Do you know that if sterilization of the unfit had been adequately employed during the past generation no such history of crime and degeneracy as that above set forth would be true to-day? Do you know that if this remedy were applied with discriminating thoroughness *now*, the future welfare of society would be more effectively safeguarded than by any other means, and at the same time many an unpromising life rescued and uplifted? Do you not believe that the appeal of posterity for a purer and cleaner social structure should be heard and heeded? Do you realize that no more vital subject than this could engage the attention of this body?"

In the discussion, G. H. Price emphasized the opposition to such laws from those who would consider their personal liberty imperiled by their enforcement. He advised further discussion and action by the medical profession to which such a move ought not to be an impossibility. J. H. White suggested that vasectomy would be sought by roués in order to relieve themselves of apprehension of the evil consequences of their practices.

The Declining Birth-Rate. F. E. Fremantle[6] discusses the declining birth-rate as furnishing a good and concrete example of a problem in vital statistics. The numerical maintenance of any geographic population must depend on the balance of four factors—namely, birth plus immigration, less death and emigration. In most statistical countries the population is actually increasing at the present time. "Natural increase," on the other hand, is the increase by births against deaths, without taking count of the figures of migration. A land, like Ireland or Italy, which loses emigrants suffers further in retaining a disproportionate number of the unfit and aged. In Canada, on the other hand, and

(6) Lancet, Apr. 22, 1911.

in the United States the population contains a disproportionate number of immigrants whose fertility veils the lesser fertility of the native-born. Even the natural increase, therefore, of any geographic population, touched by migration, is no exact measure of its fertility. Migration has a selective or qualitative as well as a numerical effect on the birth-rate.

In England and Wales the birth-rate has declined by over 10 per 1,000 during the last 35 years. In other words, on an average population of about 30,000,000 there has been a total loss to the nation from this cause alone of 175 per 1,000—some 5,250,000 persons. What war, what pestilence, what fault in political, legal, or social activity has ever caused such a loss to our man-hungry Empire?

The fall in Australasia is remarkable; for whereas 40 years ago the birth-rate in these seven colonies varied from just below 30 in Tasmania to over 40 in Queensland and New Zealand, in 1909 it varied only between 24 and 30. But in the United States the decline is declared by J. S. Billings of New York, one of the chief American authorities on vital statistics, to be greater than in any other country. Of all the 34 countries Japan alone has risen from 31st to 9th, despite a slight fall in 1903-05 and a sharp fall in 1906, doubtless due in the main to the Manchurian war. Japanese patriotism will do much to maintain her birth-rate.

In order to distinguish between the several causes of this decline and arrive at a measure of true fertility we must dissect and correct our crude rates. Unfortunately the system of English birth-registration, from which these figures are derived, is established for legal and not statistical purposes, and fails to give information on four important facts which must be taken into account in considering the birth-rate. An improved system of birth-registration, following the example of certain other countries, would give us the facts in connection with every birth as to (1) the age of the mother; (2) the number of previous conceptions, (3) and of still-births, and (4) the interval since the last birth. Figures derived from such a system of registration

might give a true guide to actual fertility. Meanwhile, however, we can divest our birth-rate of certain side issues.

Illegitimacy. There is a greater decline in illegitimate than in legitimate births. Thus in England and Wales in 40 years the crude birth-rates have sunk as follows:—

	1861.	1871.	1876.	1881.	1891.	1901.	1909.
Legitimate	32.4	33.0	34.6	32.2	30.1	27.4	24.6
Illegitimate	2.2	2.0	1.7	1.7	1.3	1.1	1.0

This decline of illegitimate births may be due to improvement in morals or to increased knowledge of and opportunities for practicing methods of preventing conception or procuring abortion after illicit intercourse. Inclusion of illegitimate births obviously introduces a confusing factor in special degree; they are best excluded from a statement of fertility.

Age at Marriage. The fertility at different ages is shown in the number of births per annum per 1,000 wives at each period of life. These figures are obtainable only where a more complete system of registration obtains than in England and Wales. In certain towns and countries the relative fertility at each age, taking that at the age 20 to 25 in each column as 100, works out as follows, the last column giving the average for the seven sets of figures from which these are selected:—

Relative Fertility Rates per 1,000 Wives at Different Ages in Certain Areas where the Figures are available, the Fertility-rate for the Age-Period 20-25 being taken as 100. (Actual Fertility-rate per 1,000 Wives aged 20-25 in Brackets.)

Age of mother.	Edinburgh and Glasgow.	Norway (1874-76).	Denmark (1880-89).	Average, excluding Berlin and Budapest.
15-20 ..	120	71	145	108
20-25 ..	100	100	100	108
..	(418)	(579)	(494)	100
25-30 ..	83	74	82	81
30-35 ..	64	62	63	66
35-40 ..	49	52	47	52
40-45 ..	19	31	23	27
45-50 ..	3	6	3	4

This table may be read as follows: In Norway 1,000 wives aged 20-25 have on an average 579 infants in a year; putting this figure at 100 the corresponding fertility for Norway at ages 15-20 is 71; at 25-30, 74; and so on. Fluctuations, therefore, in the mean age at marriage must materially influence the birth-rate.

Statistics show a diminution in the marriage rate and an increase in the proportion of unmarried persons over 15 in the community. This factor, obviously voluntary, must also be discounted with a view to obtaining a true measure of fertility. Curiously enough, the decline in fertility is even greater than that in the crude rate. Although fewer marriages and the decline of illegitimate births have led to a decline of the crude birth-rate, this effect has been more than discounted by the larger proportion of women of conceptive age in the population. Their fertility has declined even more than we expected.

Causes of Reduced Fertility. The general tendency of all these rates is a marked decline. Let us consider to what causes their decline in various communities during the past 20 years may be due.

Urbanization is not a factor. The corrected rate for selected urban counties—27—is now barely lower than that for rural counties—28; and in the 22 years, 1881 to 1903, while the rate for London has declined by 16 and for England and Wales by 17 per cent., that for four typical rural counties of Beds, Berks, Cornwall, and Rutland showed a decline of 23, 21, 29, and 28 per cent.

Occupation as such has no clear relation to the birth-rate. Agricultural counties had the highest fertility in 1881, but in 1903 the difference had almost disappeared.

Woolen industries certainly coincide with a low corrected birth-rate of 23, 21, and 22 respectively in Huddersfield, Halifax, and Bradford; but the percentage of women industrially employed does not vary directly with the rate. Mining districts, on the other hand, generally show a high rate.

Religion, on the other hand, affords some indication of the cause of this decline. Countries mainly Roman

Catholic differ little from those mainly Protestant; but the rate in Bavaria has shown little diminution since 1881, that in Ireland has actually increased, while those in the less orthodox Roman Catholic countries of Italy and France have continued their steady decline. The best comparison is that of Canada, where in 1902 the Protestants had a crude rate of 24, the French Canadians—being strict Catholics—of 44, and other Roman Catholics of 22. Measures for the prevention of conception are strictly banned by the Roman Catholic Church, as indeed by our own but, at least in orthodox countries, with greater authority.

It may be said that the proportion of men serving their country or pursuing trade abroad for part of their time has increased. But the proportion of males to females as calculated by the census has only fallen from 95 to 93 per cent. in the last 50 years.

As to social conditions, no doubt the birth-rate has declined, both in England and Germany, for instance, with the increase of social comforts. In comparing the figures for six different strata of the population in London in 1903, the total corrected birth-rate varied between 32 in the poorest class and 20 in the wealthiest class. In Ireland, on the other hand, where preventive measures are banned by the Roman Catholic Church, the corrected rate has increased, despite her share of the increase in social comfort. Bavaria and France are both prosperous, one with a high rate, the other with a low. Norway, like Ireland, is poor, but has a high rate of fertility.

Heron has made out the mathematical correspondence between various social conditions and the birth-rate. As a result he finds the birth-rate lowest in districts where professional classes are most numerous or many domestic servants are employed, and highest where labor is of the lowest type, or poverty, drunkenness, overcrowding, phthisis, and pauper lunacy are highest, and thrift and culture least. Karl Pearson has shown that 25 per cent. of the married population produce 20 per cent. of the next generation. The nation is being recruited from its least prosperous, least successful

classes in increasing degree. From every point of view save that of the anarchist, it is the least fit class of men that survives. If there be such a thing as heredity, the nation is undergoing racial degeneration.

Do the facts, then, indicate a decline in natural fertility under more civilized or luxurious conditions? It would be strange if that were so, for the birth-rate was at its zenith in 1876. Luxurious living was common before then; even the wealthier classes produced families of a dozen or more, and those dozen now produce only a dozen infants between them. The Royal Commissioners who inquired into the subject in New South Wales found no evidence of any increase of physiologic sterility in the women of the colony. The matter cannot yet be taken as proved. Instances of barrenness or of one-child families, where parents are perfectly healthy, are anxious for children and have used no checks, occur not infrequently.

The Artificial Decline. Any decline, however, that there may be in natural fertility is insignificant as compared with the artificial decline. The evidence is overwhelming, to quote again from the New South Wales report, as to "the marked effect of a force adverse to reproduction; and this force was one over which the individuals themselves have control." It is a voluntary limitation of the birth-rate with which we have in the main to deal. There are two methods: prevention of conception and destruction of fetal life; rubber goods and chemical pessaries on the one hand, abortifacients and spurious nursing homes on the other. Both methods flourish; both should be relentlessly pursued and checked by the law. It is significant that it was in 1876 that the Bristol publisher of an American pamphlet describing these methods under the title "Fruits of Philosophy" was sentenced, and Charles Bradlaugh and Mrs. Besant aggressively republished and circulated the pamphlet; and that in 1877 began the decline of the British birth-rate which has continued since.

The chief factors, then, in the decline of the birth-rate are mechanical and logical. The mechanical factors just named are in reality only methods. It is the following logical factors that are the ultimate cause.

A. In the interests of health, wives are advised to secure a two or three years' interval after the first and each subsequent birth; and after any severe confinement to avoid similar danger in the future. It is often this well-meant interval after the first birth that effects the mischief.

B. With the higher education of women comes an increasing habit on their part, both before and after marriage, of undertaking charitable, political, or other occupations, paid or unpaid, which it seems difficult, even selfish, and at least unreasonable for the young wife to abandon. Often in her desire to help her husband, intellectually and socially, it seems to her a duty to direct her seasons of child-bearing accordingly; and this well-meant intereference has unforeseen results.

C. The desire for economy strikes at all parents in every class, and especially in that class—the wealthiest—which has the largest experience of converting money into power and opportunity of every kind. Such power and opportunity will perhaps be lost through another child, whereas they may otherwise be used for the education or physical welfare of the children already born or for their "start in life" on completion of their education; or they may be required for the serious aims and life's work of the husband; or for the completion to keep or improve the position and authority of the family in the class of society to which it belongs or wishes to belong. Lastly, and no doubt only in a minority of cases, the primary object is that of leisure, comfort, and the avoidance of pain.

This desire, whether for economy or comfort, depends essentially upon the unfettered Darwinian principles of the struggle for survival of the fittest; it is a recrudescence of Nature's method for natural selection, rendered possible by the free interchange of information, as a result of the steam-engine, electricity, cheap printing, and the penny post; fostered by the time-honored liberal principles of *laisser faire* without the correcting factors of sound scientific knowledge and rigid moral discipline. Free play of natural forces, as developed by the inventions of the nineteenth century, has led by inevitable

if superficial logic to the decline of the birth-rate. Sound scientific knowledge of itself only directs into certain grooves and does not check this decline. Rigid moral discipline is hardly possible, except as part of a religious code; while scientific thought and the liberal tendencies of the last century have unhappily done much to destroy discipline and undermine religious authority. On the other hand, there must be noted the newer growth of athletic discipline, the cult of a healthy body, which, combined with the sounder scientific knowledge of the last few years and saner views of moral and religious discipline, may lead the civilized world to recognize and check the material dangers that accompany the abuse of nature in her most vital and essential activities.

How can we fight this disease and save for the individual, the empire, and the whole world the benefit of Nature's full human harvest? Such physiologic causes as there may be for this decline are beyond our ken, and for the present, if they exist at all, must be left alone; however serious to those they affect, to the nation, Fremantle believes, they are of minor importance. The chief and obvious factors are three in number: (1) The rational, due to knowledge of methods of prevention and ignorance of their results; (2) the economic, due to the inventions of the Victorian era and the consequent freedom of communication and competition in every phase of life; and (3) the moral, due to indulgence and lack of discipline.

With the economic and moral factors medical men have only indirect concern. But against the rational factor we are responsible for the remedy. Both personally and in public we must insist, as no other profession can, on the paramount value of Nature's own methods and checks, on the serious danger resulting from celibacy, from prostitution, from interference with the normal married life, from disregard of Nature's seasons; and not least, on behalf of all concerned, on the healthy influence, the gaiety, and the ultimate economic value of a well-stocked nursery.

MISCELLANEOUS.

Limits of Natural Science. E. Haeckel[8] notes the progress of the development idea since the beginning of Darwin's work. The most important consequence of this division of science affected the origin of man. It is now recognized that man is a descendant of the lower mammals, and that the older dualistic philosophy which taught that man was composed of a mortal body and an immortal soul must be given up. It must be recognized that man, like any other vertebrate, is a single being, and that body and soul in him are inseparable. This necessitates the contradiction of the traditional belief in a personal immortality of the human soul, and as this belief is closely connected with the belief in a personal God, the most important nucleus of the Christian and Mohammedan religion, the doctrine of man's evolution raised a powerful opposition on the part of the church and of the dualistic philosophy which was combined with it. Haeckel discusses the relation and differences of the two societies, the Association of Monists, founded five years ago in Vienna, and its opponent, the Kepler Association, established two years ago in Godesberg, which stands as a representative of the traditional dualistic view of the world. He indicates the impossibility of reconciliation of these two views. As the most important principles of the Kepler Association, he details the following articles of faith: 1. The personal God remains the creator and ruler of the universe (Theism). 2. Man alone possesses an immortal soul (Athanism). 3. The will of man is free (Indeterminism). The Monist Association opposes to these three dualistic dogmas the three following principles: 1. God and nature are one (Pantheism). 2. The soul of man is a function of his brain, and disappears with his death (Thanatism). 3. The will of man is as little free and quite as much bound up in his physical organization as that of all the other vertebrates (Determinism).

Haeckel also discusses the opposition of Brass, and then considers the limits of anthropology. The concep-

(8) Deutsche med. Wochenschr., Oct. 6, 1910.

tion of anthropology has been extraordinarily expanded in the course of the last fifty years, so that it now involves all branches of knowledge of man, including morals and ethics. He concludes that there is good reason to believe that we need set no bounds to the accomplishments, either theoretical or practical, of natural science. The recognition of the unity of God and nature, of the constant power of an eternal, great law in the entire universe, gives us also the conviction that the increasing application of this natural law to our ethical conduct of life will lead mankind to constantly higher stages of development.

The Physico-Chemical Theory of Life. The *British Medical Journal* [9] reviews the work of Leduc [1] which discusses the nature and properties of solutions, devoting special attention to the phenomena of diffusion and osmosis. Numerous instances are given of the morphogenetic power of the simple process of diffusion. By spreading a layer of salt solution on a glass plate. and placing in it several drops of a more concentrated solution colored with ink, diffusion pictures of remarkable complexity may be obtained, depending for their structure on the arrangement of the drops. In such a way a highly complex cellular structure may be produced, consisting of a large number of hexagonal cells, each with a nucleus and cell-contents. If gelatin be added to the layer of salt solution, a permanent record can be obtained. Allied to this is the phenomenon of periodic precipitation. When the drops which are added to the layer of salt solution contain a substance which forms a precipitate with the salt, it is found that the precipitate is thrown down in concentric rings around the drop. In this way the addition of a number of drops regularly arranged gives rise to most elaborate precipitation figures. The process of karyokinesis can be simulated by a simple diffusion experiment. A layer of saline solution is spread on a plate, and this represents the cytoplasm. The nucleus is formed by a drop of the same solution, colored with ink. The presence of the

(9) Oct. 8, 1910.
(1) Theorie Physico-Chemique de la Vie et Générations Spontanées, by Stephane Leduc, Paris: A. Poinat, 1910.

ink lowers the molecular concentration and the osmotic pressure of the drop. On each side of the nucleus is placed a drop of a more concentrated salt solution, slightly tinted. These form centers of attraction, and represent the centrosomes of an actual cell. The coloring matter in the nucleus thereupon begins to form a long, closely-rolled, spiral ribbon; this breaks up into long strands, which arrange themselves in the shape of the familiar mitotic spindle. The strands converge towards the centrosomes, and gradually the spindle divides into two along its equator, until finally the nucleus is completely divided, and in its place are two new nuclei represented by two darkly-colored drops in the positions originally occupied by the centrosomes.

It is to osmosis, however, that Leduc attaches most importance as a morphogenetic force. It is, as he argues, the very motive power of all forms of life. Upon it essentially depend the vital processes of assimilation and nutrition. An animal or plant can live and grow only by virtue of osmosis. Not only is osmosis responsible for the maintenance and continuance of life, however, but it is also capable of creating living matter from its elementary constituents; it is, in fact, practically equivalent to the vital force which we term life. Leduc does not commit himself to such a definite statement, but there can be little doubt that that is his tacit opinion, and his experiments and deductions give sufficient ground for such a belief. His argument is somewhat as follows:

The whole theory of evolution would be a dead-letter were the possibility of spontaneous generation, in some form or other, denied. Evolution admits of no break in continuity, and it is absolutely necessary to connect the simplest forms of living matter with inert matter. Lamarck recognized this and was the first to give it definite expression. Lamarck, Darwin, Haeckel, and many others have investigated the laws of evolution, and have shown, amongst other things, that natural selection acts upon variations, but they have not sought to probe the question of how those variations have arisen, how they have been produced. This is evidently

a matter the explanation of which must be sought for amongst the most elementary of vital processes. In osmosis we have a fundamental physico-chemical force capable of elaborating not only simple shapes, but also shapes resembling highly organized animals and plants.

The morphogenetic power of osmosis is best illustrated by some simple examples. When a substance soluble in a concentrated solution is placed in a liquid with which it forms a colloidal precipitate, it becomes surrounded by a thin layer of this precipitate, which forms an osmotic membrane. Water penetrates this membrane from without, and, being retained, causes it to distend. In this way an artificial cell is produced, the original substance being, as it were, the nucleus and the osmotic membrane the cell-wall. Such a cell can be produced by placing a fragment of calcium chlorid in a concentrated solution of potassium carbonate. The osmotic in this case is composed of calcium carbonate. The cell may grow to a large size, but more frequently it gives rise to another cell and yet another, until a perfect tissue is formed. A great variety of other substances and solutions may be used in the same way, each giving rise to a characteristic formation. Thus, by dropping a pellet composed of copper sulphate and sugar into water containing sodium chlorid, potassium ferrocyanid, and gelatin at 35° C., a highly complex, plant-like form will be evolved, consisting of roots, branches, and leaves. Corals, seaweeds, mushrooms, shells, etc., can all be formed by a similar procedure. The resemblance to living beings does not end at outward appearance, for the internal contents of these structures consist of a viscid fluid displaying movements like those of protoplasm. Further, when the osmotic membrane is ruptured this fluid escaping forms a coagulum which closes the wound just like a blood clot. There are other analogies between these osmotic productions and living beings, and the only essential difference would appear to be that they do not consist of protoplasm, and are therefore not living matters as we understand it. These facts and experiments have some relation to the origin of living beings, and may lead to the successful experimental production of low forms of life.

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